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ABSTRACT

Developed by curriculum coordinating unit staff, this teacher's handbook was prepared for use in planning and implementing a course in career orientation. Material for the course is divided into eight instructional units which correspond to Roe's eight categories, namely: (1) Service, (2) Business Contact, (3) Organization, (4) Technology, (5) Outdoor, (6) Science, (7) General Culture, and (8) Arts and Entertainment. The course is recommended for the ninth grade level with an enrollment of from 10 to 20 students per class. The instructional procedure includes an overview phase, a transition phase, an exploration phase, and a projection phase. This final phase is expected to develop the student's ability to project an educational program designed to yield successful occupational entry and advancement. Also included in this handbook is information on testing, student objectives, teacher objectives, and suggested activities. (Author/JS)

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TEACHER'S HANDBOOK

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PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

Sponsored by the
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ACKNOWLEDGMENTS

The initial development of the material in this publication was through the efforts of the supervisory staff of the Division of Vocational and Technical Education. At that time a tentative title of PREVOCATIONAL was assigned. With passage of the 1968 ammendments to the Vocational Act of 1963, additional emphasis was placed on vocational instruction designed to assist individuals in the making of informed and meaningful occupational choices. The scope of PREVOCATIONAL was broadened and the Curriculum Coordinating Unit was assigned the task of developing a course of study in OCCUPATIONAL ORIENTATION. The entire staff has been heavily involved in continued development since that time.

The staff of the Curriculum Coordinating Unit wishes to acknowledge the efforts of the state supervisory staff who, under the direction of Mr. A. P. Fatherree, State Director of Vocational-Technical Education, originally drafted the course of study. These people are:

Larry Godfrey, Chairman, Supervisor of Industrial Arts Education
Ida Gray, Supervisor of Home Economics Education
Joe McDaniel, Supervisor of Vocational Guidance
B. C. Messer, Supervisor of Trade and Industrial Education
Conway McCracken, Supervisor of Business and Office Education
Arthur Nabers, Supervisor of Industrial Arts
William Pace, Supervisor of Distributive Education
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The staff of the Curriculum Coordinating Unit also acknowledges incorporation in Occupational Orientation of a part of the Willowbrook, Illinois program, "Project CVIS." The structure of the identification of educational aspiration, as cited in the Teacher's Handbook, was used as found in the Illinois study.

The staff is grateful to Bennie Curtis, Supervisor of Vocational Guidance, Manpower Section, Division of Vocational and Technical Education, Jackson, Mississippi. Mr. Curtis prepared the section on psychometrics as found in the Teacher's Handbook.

WHAT IS OCCUPATIONAL ORIENTATION?

Occupational Orientation is the newest member of the Vocational family. Intended as a course of study for the lower grades in the secondary school, it seeks to stimulate the decision-making process for all students, both college-prone and non-college-prone.

WHAT IS THE IMPETUS BEHIND OCCUPATIONAL ORIENTATION?

Educators have known for a number of years that the needs of secondary school students for occupational exploration and planning were not being met. Statistical studies report a phenomenal dropout rate and a marked lack of direction in large numbers of those remaining in school. Numerous pilot studies and limited-enrollment programs have demonstrated that secondary school students respond to occupational planning.

The Vocational Amendments of 1968 authorizes funds to stimulate establishment of such programs. Occupational Orientation is the initial effort in Mississippi.

WHAT IS THE AIM AND HOW WILL IT BE ACHIEVED?

The aim of Occupational Orientation is to stimulate the career-decisioning process in secondary school students. To achieve this aim, each student will be acquainted with his own abilities and interests and will explore a broad range of occupations.

The experiences in Occupational Orientation can be more fully characterized as each student does the following:

1. Examines the characteristics common to all occupations.
2. Familiarizes himself with his own aptitudes, interests, and achievements.
3. Inquires into the principle activity focus in each of several categories of the world of work.
4. Explores occupations in each of these categories.
5. Plots a course of action for further exploration or for education/training leading toward occupational entry.

These experiences will not only stimulate the career-decisioning process but also implant important concepts, namely: (1) that there is an organized approach to reviewing the world of work, (2) that an individual's abilities and interests can be and should be objectively weighed, and (3) that one's occupation can be a matter of choice rather than chance. These concepts and experiences are invaluable to the one person in five currently planning careers. These concepts with the experiences are illustrative and broadening for the remainder of persons who will come to the point of decision at some later date.

WHAT IS THE BASIC STRUCTURE OF THE COURSE?

The challenge of presenting information about the "world of work" is indeed great. A sound basic structure is essential, and it necessarily must be followed by carefully planned instruction which is properly executed. Traditionally, vocational education has taken its basic structure from the authorizating legislative acts. Subdividing and categorizing has been "along service lines."

In planning this new course, several organizational structures were considered, such as that used in compiling the Dictionary of Occupational Titles, the traditional service lines, and the Roe schema.[1] Dr. Roe's plan grew out of years of work in a professional field. It is supported by considerable research. However, the factor most useful to the instructor is that the categories in the schema are compatible with half a dozen nationally recognized and normed interest inventories.

The Roe schema is two dimensional; that is, it has height and width, and in appearance is much like a graph or calendar. There are eight columns horizontally which are called **categories.** These categories are the key to the schema and to the course of instruction. Each category is unique in that all occupations therein have a common focus–the primary nature of the activity. This activity focus will be explained later.

Each category is subdivided vertically. The six subdivisions are called **groups.** The basis for the subdivision is the degree of responsibility, capacity, and skill, with responsibility considered primary. Responsibility refers not only to the number and kinds of decisions to be made but also to how many different kinds of problems are to be solved.

Combining the two, we have a chart with eight categories across and each is six groups high. Approximately 600 occupations have been analyzed and placed within one or more of the "cells". Some occupations appear in more than one group and occasionally in more than one category. This is easily understood when we consider the liberties taken with job titles and the manner in which the activity focus may change markedly with job change. A list of the categories and typical occupations within each is found in Unit 1, Introduction, page 5.

WHAT IS THE PLACE OF OCCUPATIONAL ORIENTATION IN THE SECONDARY CURRICULUM?

At what level should Occupational Orientation be offered? Occupational Orientation has been accredited by the Division of Instruction for the upper four grades of the secondary curriculum. Ideally, it should be placed in the curriculum so that students would complete it just prior to entering vocational training. With the continued growth in the number of vocational programs being offered, both in the regular high schools and in the rapidly developing area vocational schools, training will be available to all eleventh and twelth grade students. It would seem then that for most students the tenth grade is the optimum time. However, most students could best profit from vocational instruction after they have had prerequisite courses such as applied mathematics and science. Students who elect technical careers will need to plan a full secondary curriculum. The same holds true for students planning careers requiring college degrees. Therefore, it is recommended that administrative planning should be aimed toward making the ninth grade the optimal time for the majority of students to request enrollment in occupation orientation. Enrollment of large numbers of upper-grade students is to be considered an emergency procedure. Local administrators are encouraged to poll students to determine demand for Occupational Orientation, to prepare staff to accomodate potential enrollment, and to schedule necessary sections in years to come.

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[1] **Roe, Anne. "Psychology of Occupations," p. 151.**

WHAT CRITERIA WILL BE USED IN SCREENING STUDENTS?

Traditionally, vocational education is for those who "want, need, and can profit from the instruction." The intent of the Vocational Education Act of 1963 and of the 1968 Ammendments is the same. They go a step further in requiring that a commitment, or "want", be a matter of record. The commonly held opinion among educators is that all students need and could profit from improved methods of orienting them to the world of work. A reasonable conclusion seems to follow: that every student meets the qualifications for Occupational Orientation if he or she is willing to make a commitment. The challenge to the local school is developing administrative practices which effectively permit each student to profit from this new opportunity.

WHAT PRIORITIES ARE SUGGESTED FOR ENROLLING STUDENTS?

While Occupational Orientation is essentially a ninth grade course, upper-level students should be allowed to enroll. This is particularly true in the immediate future. Initially, the number of applicants for Occupational Orientation may exceed the ability of the local school to provide instruction; therefore, priorities for accepting applicants must be established. Two groups need immediate assistance. Students identified as potential dropouts should be given top priority. Second priority should be given to regular students in upper grades, with the twelth grader given first consideration, then the eleventh grader, followed by the tenth grader. The order listed makes it obvious that students given higher priorities are those having a smaller chance at Occupational Orientation, yet having a greater need for assistance in occupational planning.

WHAT IS THE RECOMMENDED ENROLLMENT IN OCCUPATIONAL ORIENTATION?

The recommended maximum enrollment is twenty students, and the minimum is ten. Larger enrollments will not allow adequate supervision of classes in which individual activity is the key. Offering instruction to fewer than ten is not considered effective use of public funds.

WHO WILL TEACH OCCUPATIONAL ORIENTATION?

Regular vocational teachers who hold a vocational license and who have successfully completed courses in "The Study of the Individual" and "Occupational and Educational Information" will receive initial certification as Occupational Orientation instructors. These two required courses may be taken from any Mississippi public institution of higher learning having an accredited counselor-training program. Qualifications for full certification are under study.

WHAT TYPE OF FACILITY IS MOST DESIRABLE FOR OCCUPATIONAL ORIENTATION?

An educational facility has as its basic purpose the support of learning activities. There are three basic types of activities in Occupational Orientation. First, group instruction will be employed for the most part in Phase I, and the facility must provide a lecture area with provision for the use of audiovisual materials. Second, research activities on an individual basis are essential to provide each student with detailed, substantive information about each specific occupation. A research library with individual carrels will allow each student to draw upon printed and audiovisual materials. Third, exploratory activities involving tools, instruments, and materials are essential for students to explore and/or reinforce the manipulative side of specific occupations.

Any facility which is to adequately support Occupational Orientation must properly provide for all three of these types of activities. The course in Occupational Orientation is new. Facilities currently existing must be utilized initially. Projections on adaptation of existing facilities is a decision to be considered by each school in the light of local and state conditions.

WHAT IS THE TEACHING SEQUENCE?

The basic structure of Occupational Orientation is provided by the Roe schema; that is, the course is divided into eight instructional units which correspond to Roe's eight categories–Service, Business Contact, Organization, Technology, Outdoor, Science, General Culture, and Arts and Entertainment. A ninth unit, the Introduction, is added to orient students.

WHAT TWO ESSENTIALS ARE CONTAINED IN THE INTRODUCTION?

There are two major parts to the INTRODUCTION. One of these is the administration and interpretation of a battery of psychometric tests. At least one test should be selected to measure each student's intelligence, one his interest, and one his achievement. Tests for each of these qualities are listed in this handbook under Psychometric Testing. Each test should be administered exactly as the directions state. The tests should be administered on the first day of school or immediately thereafter and the tests returned immediately to the parent company for processing.

While waiting for the test results, the remaining part of the INTRODUCTION should be covered. Characteristics common to all occupations–such as the rewards of work, work ethics, and occupational patterns–are presented through group instruction using the instructional media available. Heavy emphasis should be placed on basic characteristics of all occupations–such as education required, methods of entry, methods of advancement, and qualities of those successfully employed–so that each time a student explores an occupation his search will be more efficient and more meaningful.

When the test results are returned, there should be a thorough explanation of them, including their value and their shortcomings, followed by a group discussion to clarify understanding and to reduce anxieties. Each student should be shown his scores and advised individually by the counselor concerning what impact these tests should have on his school and occupational plans. Sufficient time should be devoted to tests and test results so that each student understands how to relate his scores to educational and occupational demands.

Following completion of the INTRODUCTION, the eight categories are taken in turn. These categories have been listed in the sequence suggested by Roe since she states that there is a relationship

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between those in juxtaposition.[1] This sequence of categories is suggested, but is not essential. Regardless of the sequence, the instructional procedure within each category is the same. The procedure is: Phase I, Overview; Phase II, Transition; Phase III, Exploration; Phase IV, Projection.

Phase I, an overview, explains the focus of the activity of those engaged in occupations in the category. For example, persons employed in occupations in SERVICE are engaged in face-to-face and, more important, person-to-person activities; the emphasis is on serving or helping people, in dealing with their problems, and in rendering assistance of a personal nature. The instructor who is able to present this **concept** will have assisted students in grasping a basis for further comparisons.

HOW IS THE OVERVIEW GIVEN IN PHASE I?

Phase I uses group methods of instruction, such as formal and informal lecture, group discussion, instructor-operated audiovisual aids, small-group activities, and resource persons. This type of learning has been characterized as "reaction" learning in that students have little previous experience from which to develop an exchange of ideas; thus they simply react to information presented.

Notice that the SOURCE MANUAL lists and defines occupations in each category. Students must be presented with a characterization of these occupations to illustrate the manner in which the concept "service" is found in a variety of occupations. Also, students usually have little contact with and less insight into occupations. Their limited contacts usually result in one-sided views about the remuneration, work conditions, etc. of those few occupations within their experience.

To strengthen this defficiency of occupational knowledge, a brief characterization should be given for each of the occupations in the category. If the occupations are too numerous, they should be characterized by cluster, and details added when advisable. Without a doubt, the most effective method of presenting a brief characterization of these occupations is through the use of audiovisual materials. The bibliography lists films, filmstrips, slides, audio tapes, and others which contain such material. Community resources will also be useful. Several persons from outside the school could be invited to give a ten-minute characterization of their work; group tours of businesses, offices, plants, and farms could give invaluable insight. If any of the preceding are not available, the instructor should draw upon printed materials to prepare written or verbal descriptions. Whatever method or combination of methods is used, its effectiveness can be evaluated in terms of how successfully it broadens the student's insight into a greater number of occupations, thus allowing him wider choice for exploration in later Phases and in adult life.

The final step in Phase I should be the administering of a pre-test such as the one in Appendix A. At this point the student will be aware of what occupations are contained in the category under study. He can give responses based on the overview and on his previous personal experience.

HOW IS THE TRANSITION MADE IN PHASE II?

Phase II is a transition for the students and, while their directions for action may be given on a group basis, each student begins to act individually. The Transition Phase encourages each student to begin

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[1] Roe, Anne, "Psychology of Occupations," p. 144.

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individual exploration of one or more occupations. Ideally, the selection of **which** occupations to explore should be made on some **basis** or **intent**. Avoid a tendency to permissively allow indiscriminate or irresponsible rambling.

One basis or intent for selecting an occupation which has been effective is that of educational aspiration. Following this method, the instructor asks each student to identify his intended educational plans. Six different levels for terminating formal education are provided, as follows:

(1) No further education/training beyond high school
(2) Limited on-the-job training (2-6 months)
(3) Business/trade school or apprenticeship
(4) Junior college (2 years) or technical school (6-18 months)
(5) Four years of college
(6) Advanced degrees after college (Ph.D. or M.D.)[1]

The reason for this is easily explained: first, while it cannot be "proved," our most reliable way of predicting success in post-high school education is to judge success while in high school; second, there is a strong relationship between the amount of education completed and the type occupations open to applicants. These two factors hold in all eight categories and this method of transition is recommended for each.

When a student indicates a given educational level, he is shown a (matched) list of occupations and advised that these generally require his planned educational level. The list of occupations is found in the respective Units, with the matching implied. The highest level of education is matched to Group IV, the next highest level of education to Group V, the third highest level to Group VI, and so on.

In addition to the foregoing educational intent, other purposive bases might include interests expressed by the student, interests demonstrated by an inventory, an out-of-school activity, an identified aptitude, or the student's school record. The reason for recommending that occupational exploration be planned from some base should be obvious. It is a scientific approach to identify a focal point; to search for, select, and compile pertinent data; and to make a decision based on this data.

While this procedure is strongly recommended, absolute adherence may be undesirable. Random brousing by the student is acceptable in that it may serve to reduce distracting curiosity and it may stimulate a dormant interest.

HOW IS INDIVIDUAL EXPLORATION ACCOMPLISHED IN PHASE III?

Once the student indicates his intended level of education, he is presented a group of occupations which generally require that educational level for entry. He then elects one or more of these occupations to explore; only one is explored at a time. The pretest administered in Phase I can be used to guide his selection.

The first step in Phase III is the reading of an occupational brief, monograph, or brochure appropriate to his interest and group as identified above. Remember that the purpose of the psychometric testing was to provide the student with objective data about himself. This initial exploration, the study of a brief, will provide him with data about the occupation so that he can begin meaningful exploration–a comparison of his abilities with occupational requirements. Exploration is supported by positive and negative reinforcements in the cognitive, psychomotor, and affective domains.

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[1] Harris, Jo Ann, "A Report on Project CVIS", p. 18.

An Occupational Study Outline is found in Appendix B. The purpose is to guide their reading by causing them to raise key questions. Hopefully, their approach will become an analytical one. The instructor may find this question outline valuable as a format for written reports to be handed in. The outline is useful when reading a brief; it is also useful when studying an occupation in greater depth. Such a study would add detail and clarity to any report.

Following the study of the brief, the student may elect several courses of action. He may decline further exploration of the occupation. If this occurs, the teacher should counsel with the student to determine why this decision was made. What is the responsible decision? Did he find requirements which he could not or preferred not to meet? Are there ways of overcoming such obstacles?

The student may elect to examine the occupation in greater depth. Examination will involve one or more of several learning media.

> He may read from a number of publications, have widely varying formats and approaches, such as encyclopedias, dictionaries, trade, occupational, professional manuals and journals, biographical and fictional novels, and standard textbooks.
>
> He may view projected materials such as movies, filmloops, slides, and filmstrips.
>
> He may listen to audio tapes of interviews and testimonials.
>
> He may develop projects in various forms. Each project may require the gathering of data both in and out of school; may require analyzing and synthesizing data; and may require presentation of a finished activity, service, or product in written, performed, or fabricated form.
>
> He may involve himself in the community, under the supervision and direction of the instructor, arrangements for community experiences would be through a cooperative agreement between the school and the business or agency. Community experiences could be for varying lengths, on a steady or intermittent basis.
>
> He may involve himself in exploratory experiences largely of a manipulative nature. The major emphasis will be on determining interests and abilities of a manipulative nature; on discovering types of processes, materials, and tools which he prefers; on desire to work with "things", rather than people or ideas; and on preferences for custom or service activities.

All of the foregoing suggest that the role of the teacher in Phase III is that of a manager of learning, rather than that of the sole source of information. Phase III requires a more nondirective approach on the part of the teacher, reinforced by a counseling role in which he assists the student in determining direction, planning exploratory steps, and evaluating experiences. The emphasis is on reality testing, not on occupational selection.

WHAT IS THE PURPOSE OF PHASE IV, EDUCATIONAL PLANNING AND PROJECTION?

Occupational planning is one of the characteristics of a responsible individual. Armed with personal insight and occupational data, each student can now project an educational program designed to yield successful occupational entry and advancement. Even those students who plan no formal education beyond high school can plan realistically. They are now aware of names of occupations which accept high school graduates, and they can use local sources of job availability to locate openings. They can begin interviewing and can inquire about desired courses which they can schedule during the short time remaining. The same process holds true for students planning apprenticeships or entry into the military.

Students planning post-secondary education in vocational schools, technical programs, or colleges can review entry requirements as found in brochures and bulletins from these institutions. The practice holds true for both public and private schools. Interviews with counselors in these institutions, appointments with teachers and department heads, participation in high-school-day programs on other campuses all yield valuable contacts.

The teacher is obviously a manager of learning in Phase IV. He can gather catalogs, brochures, and pamphlets for student examination. He can schedule educational tours to businesses, agencies, and schools offering apprenticeship programs, on-the-job training, and formal training/educational opportunities. The emphasis in Phase IV is on projection—on planning the next major step in life for occupational entry, not on selecting and being accepted to a school. Each student should be encouraged to prepare a projection for at least one occupation in each category.

WHAT TEACHING TECHNIQUES ARE SUGGESTED FOR OCCUPATIONAL ORIENTATION?

Occupational Orientation will employ all the teaching techniques which have been demonstrated to be effective. However, the instructor will likely rely more heavily on the techniques his professional judgment dictates and those where instructional equipment and supplies are available. A brief statement follows which suggests how these might be most effectively used in Occupational Orientation. If you require review on any of these, consult any standard reference on methods of teaching.

Lecture: The instructor's lecture is very valuable in presenting information not readily available to each classmember. The lecture can be based on material having valid content, yet of questionable form for direct student access. Also, some shortcoming of the lecture method can be offset, for example, monotony and low student-retention, by combining it with other techniques such as slides, films, and tapes. These aids are essential in injecting interest, expertise. All teaching materials should be screened. *Extensive use of the lecture method in Occupational Orientation is not recommended beyond Phase I.*

Motion Pictures: An appropriate motion picture is a stimulating, informative method of teaching. It appeals to the senses of sight and sound, and can simulate any locale and condition. The variety of film subjects available is almost unlimited when we consider not only commercial film companies, but also professional societies, public work agencies, and business-industrial groups. Students are prepared before the film showing to encourage higher levels of learning. Indicate the purpose for showing and list points to look for to give purpose to viewing. Follow each film or group of films by a review of important points and a discussion.

Film Loops: The film loop is a relatively new addition to teaching media. In essence, it is a strip of movie film which has had the two ends spliced together, it is then placed in a clear plastic case which is termed a "cartridge." When placed in a special projector, a three-to-five minute movie is shown on a small screem. The loop is usually for a single learner or for small groups of eight or less. Some loops are available in color and sound. One major advantage is that the self-contained cartridge can be used by students.

Filmstrip: The filmstrip is a much more economical and more flexible visual method of instruction. The viewing time may be varied with each frame, thus allowing questions or discussion for difficult points.

Slides: In addition to the advantages offered by film strips, a presentation using film slides allows the instructor to sequence the content as he prefers. The exercise of caution will reduce the tendency to place a few slides in upside down or backwards. Some filmstrips and slide sets are accompanied by a record or audiotape, which requires special equipment.

Television: Instructional television has many of the same advantages of the motion picture. Relatively few television tapes are currently available, but their number is increasing and many facilities constructed within recent years have the wiring installed for future use. Recording cameras and playback equipment are currently available for schools. They are moderate in price compared to commercial equipment, can be operated by an instructor, and are sufficiently portable to allow taping material outside the school for replay in class. This practice is equally as educational as a field trip. Video tapes may be stored similar to movie films, or may be exchanged among schools.

Printed Material: Directed readings in a variety of printed matter has two major advantages. One, it is a relatively inexpensive method of injecting detailed information into the program. Two, it permits individual exploration along lines of interest, when the material is in looseleaf form. The **occupational brief or monograph** is a one-to-four page description of an occupation, occupational cluster, or occupational family. A wide range of titles may be purchased from a number of publishers. Several are listed in the bibliography. A wealth of free material is available from corporations, agencies, societies, and the like. Requests on letterhead stationery is the prefered method of inquiry. These, too, are listed in the bibliography. In addition to the previously mentioned material, there are numerous hard-bound publications which describe jobs, occupations, and careers. The format of each is largely unique. These publications make excellent standard references and should be a part of every capable library. Since these are bound, each can be used by only one student at a time. The cost of sufficient multiple copies prohibits their purchase. The occupational briefs or monographs previously mentioned should provide the base of individual study.

One other form of printed matter is worthy of note – the occupational exploration kit. These kits are produced by a number of publishers with the resultant variation in format and content. Generally, they contain printed occupational data in single or pamphlet form, coordinated psychometric tests, recommendations on further exploration, and suggest school and community experiences. The fact that a kit has been assembled will save considerable time. Use of the assembled material will likely be expidited by following the instructions and the format which accompanies the kit.

Simulated experiences are approximations of an experience. Normally these are largely within the confines of the school, yet varying degrees of contact outside the school are often used, adding realism to the experience. Typical examples are sales demonstrations, design and fabrication of a product, growing plants or raising animals, caring for a home, and writing business letters or news articles.

Directed Experiences: Work experience in the community can be a vital part of the program and involves placement of students in businesses, industries, and community services. Placement and work activities should be under the supervision of the Occupational Orientation Instructor. Unlike Cooperative Education which requires long periods of steady employment, work in orientation may be short term or intermittent. Students should be required to prepare written reports evidencing an analysis of the occupation and comparing their abilities.

Shared Teaching Assignments: Content and insight can be injected into the program by involving persons other than the regular instructor. There are a variety of ways of doing this, each called a different name. **Team teaching** is an involvement of other professional educators on a shared basis. Each takes responsibility for a major portion of the content. The subject area of each member of the team is closely related. **Differentiated staffing** also involves professional educators. However, they usually are involved for a short time and were not a part of over all course planning and construction. Their purpose is to inject ideas which have bearing on the subject but have limited application. **Resource persons** are normally persons outside the educational community who provide information which may have major, moderate, or minor impact. Their responsibility for course construction is little, but they may provide a major portion of the content by following an agenda and format supplied by the instructor.

WHAT DO VOCATIONAL GUIDANCE, COUNSELING, AND PSYCHOMETRIC TESTS CONTRIBUTE TO OCCUPATIONAL ORIENTATION?

Vocational Guidance is the process of reviewing, exploring, choosing, entering into and making progress in a vocation harmonious with a thorough and realistic self-knowledge with total awareness of cultural influences both positive and negative. The end result would be complete job satisfaction and satisfactoriness.

Counseling is a process of helping people to help themselves, in which an experienced and qualified person assists a second person to understand himself and his opportunities, to make appropriate adjustments and decisions in the light of this insight; accept personal responsibility for his choices and to follow a plan of action in harmony with these insights.

In teaching we must of necessity treat students as though they were more alike than they really are. We cannot take **all** individual differences into account. Someone once said, "No difference is a difference unless it makes a difference." In other words, we should attempt to identify those areas of individual differences which affect most markedly the performance of students in school and which are of such a nature as to lend themselves to differential treatment on the part of teachers and counselors.

Two valid reasons why teachers and counselors should be concerned with studying students are: (1) to develop an understanding of students in order to provide them with needed help; and (2) to help each student to better understand himself and, as a result, grow in ability to solve his own problems effectively.

The two purposes referred to in the preceding paragraph can be thought of in terms of remedial, preventive, and developmental goals. Sometimes we use the information we obtain about students in order to help a particular student in difficulty. When we do this, we have a remedial goal in mind. Sometimes, however, we use student information in order to help a particular student avoid getting intangled in a difficulty toward which he appears to be heading – a preventive goal. Most commonly, though, student appraisal procedures are used in order to help each student make better use of his personal and environmental resources. In this sense, our goals are neither remedial nor preventive, but rather developmental in nature. It is the developmental type of goal which makes it essential for teachers and counselors to better understand every student in the school, thereby implementing their belief that every student in the school is important, and worth while.

To assist us in this complex activity we utilize the use of standardized test instruments. It should be recognized at the outset that a testing program is sound only when it is an individual program for each student. It is generally agreed that three kinds of tests are needed for working with nearly all students: scholastic ability, achievement, and interests. These tests will be given to groups of students rather than individually. These tests yield evidence that is essential in determining students' progress and in guiding students' plans.

WHAT ARE THE CRITERIA FOR SELECTING TESTS?

Fortunately, the prospective test-user does not need to compute the statistics required to determine the sampling adequacy, reliability, or validity of each test under consideration, because the test maker has already done so, just read your manual that you receive with the test.

You should look for the answers to the following questions when reading the manual:

1. Reliability – Does this test produce consistent results? That is, would the person or group taking the test repeatedly get approximately the same scores?
2. Validity – Does this test measure what it says it measures? Does this test measure something that is important to know about students?
3. Norms – Has the test been given to a large enough sample of students who are similar in age, sex, and background to the students who are to be tested? Has the test also been given to a large enough sample of people with whom the counselor's students or your students are now competing or will later compete? If both of these questions can be answered affirmatively, it is likely that the manual has appropriate norms, i.e. standards for judging performance and interpreting test scores.
4. Practicality – If the test has a time limit, is it short enough so that the test can be completed by nearly all students within the usual classroom period; if not, can the test be stopped and started again later without affecting the results adversely? Most schools find it desirable to select tests which can be completed entirely or part by part during regular class periods.

WHAT IS SCHOLASTIC APTITUDE?

The term "scholastic ability" is used synonymously with such terms as "scholastic aptitude," "academic aptitude," "general intelligence," and "mental ability." While this may be somewhat confusing to the beginner in the testing field, it should not be a matter of great concern to you. The important point to recognize is that however scholastic ability is designated, evidence concerning an individual's intellectual functioning must be gathered if he is to be helped effectively. Scholastic aptitude is defined as the ability to learn from the tasks required in school or, more specifically, from books.

WHAT IS THE MEANING OF I.Q.?

The I. Q. is nothing more nor less than a convenient means of representing a child's mental age (intellectual development) with relation to his actual age in years. The I. Q. or intelligence quotient is exactly what its name implies—a quotient or ratio between the child's mental age (M.A.), determined by testing and his age in years at the time of testing, or chronological age (C.A.) formula I. Q. = $\frac{\text{M.A.}}{\text{C.A.}}$ X 100.

WHAT ARE ACHIEVEMENT TESTS?

Achievement tests measure what has been learned. What a person achieves is of necessity influenced by his potentiality (or aptitude) for the activity. Therefore, achievement tests are often good indicators of aptitude. They also measure what has been taught. Scores on achievement test are excellent bases for the prediction of the future educational success of individuals in the subjects covered by the tests, afford very helpful clues for purposes of vocational guidance, and are significantly correlated with aptitude and with interest. Thus tests of achievement help to provide information concerning the general academic aptitude and the functioning interest of each individual, and probably should form the core of the systematic testing program of every school which hopes to do a thorough and objective job of guidance.

WHAT IS INTEREST AND WHY SHOULD IT BE IDENTIFIED?

Interest may be thought of as one of the forces that motivate activity. In other words, they represent a tendency to select one activity or thing in preference to something else, to choose one instead of another. Said even more simply, interest are likes. The four ways used to collect information pertaining to students interest: (1) observing the individual, (2) getting his expression of interests, (3) studying the activities in which he has engaged, and (4) measuring his interest by means of an interest inventory.

When we use the Interest Inventory which is proclaimed to be by far the best technique to use, use it with all information and data that you have at your disposal. Too often the interest inventories are used in isolation, apparently on the assumption that they can stand alone and tell the whole story. But the fact is that interest test scores have real meaning only when they are a part of a large body of knowledge about the individual.

HOW ARE INTEREST INVENTORIES USED?

1. To identify unknown or unrecognized interests.
2. Confirmation of claimed interests.
3. Identification of potential or actual conflict between claimed and measured interests.
4. To identify discrepancies between interests and aptitudes or abilities.
5. To identify potential or actual conflict between two or more distinctive interest types of groupings.
6. Vertification of the absence of differentiated interest patterns.
7. To identify problems associated with masculinity-femininity, interest-maturity, or occupational level as non-occupational determinants of interest.
8. To identify educational or vocational maladjustment due to inappropriate interests.

SUGGESTED TESTS FOR OCCUPATIONAL ORIENTATION

The following tests meet the criteria outlined above. They are suggested for use by local schools in developing individual profiles. Most schools now have a testing program. If records are available on testing administered in the past two years and these tests meet the above criteria, the data may be used without retesting. Local schools are encouraged to locate and use other psychometrics in the interest of building a stronger testing program.

Preliminary

Achievement

California Test – Forms W, X, Y, & Z
A. Intermediate – Grades 4, 5, & 6
B. Junior High – Grades 7 – 9
C. Senior High – Grades 9 – 14

The California Achievement Series is designed for the measurement, evaluation, and diagnosis of school achievements. This series is composed of reliable and valid test of skills and understandings in reading, arithmetic and language.

Intelligence

1. SRA – PMA (Primary Mental Abilities)
   Grades 4 – 6, 6 – 9, and 9 – 12.
   This test measures the following areas: Verbal – Meaning, space, reasoning, number ability, word fluency, and perceptual speed (K-6 only). It also gives a total I.Q. score as well as I.Q. scores for each subtest.

2. SRA - non-verbal for poor readers. You could use it with all students.

Interest

1. Kuder Form DD – Grades 11, 12, and adult.
2. Kuder Form E – Grades 8 – 10.
   This form measures an individuals degree of preference for activities in ten areas: outdoor, mechanical, scientific, computational, persuasive, artistic, literary, musical, social service and clerical. Form E is particularly effective for use with junior high school students as a part of a comprehensive exploratory program. Individual profile leaflets help the student interpret his scores and direct his attention to broad vocational areas that are in keeping with his interest.

SRA – Purdue Pegboard. Grades 9–12 and Adult.

This test measures two kinds of finger dexterity; both related to productivity in routine manual jobs. Movements of hands, fingers, and arms and controlled manipulative movements of small objects.

This instrument could be given to those students whom you feel aren't being realistic in vocational choice, to verify mechanical aptitude.

The Pegboard is a 12 x 18 inch board. It has four cups for pegs, collars, and washers. It also has two colums of holes through its center. In the first part of the test, the examinee is required to insert the pegs in the holes, using hands singly and then together. His score is the number of pegs he inserts during the time allowed. In the second part of the test, the examinee is required to assemble the pins, washers, and collars. His score is the number of assemblies completed within the time limit.

Aptitude Tests for Occupations

These tests are intended to aid in vocational counseling of high school students, college students, and adults by providing useful information on individual aptitudes and potentialities.

These tests include:

1. Personal-social aptitude
2. Mechanical aptitude
3. General Sales aptitude
4. Routine clerical aptitude
5. Computational aptitude
6. Scientific aptitude
   Grades 9 – 13 & Adults

Post-Testing

Interest

1. Kuder Form DD, should be administered again to evaluate whether there has been an extreme change of interest after having had training, information, and exploratory experiences in the various areas.
2. Strong Vocational Interest Blank for men and women.
   This instrument was normed on professional groups. Therefore, it could be used as a vertification tool for interest in the professional vocations.

Vocational Planning Inventory – SRA

1. Grades 8 – 13
   The Vocational Planning Inventory is a comprehensive testing program that yields individual predictions of success in the major vocational curriculum areas. It does so by measuring an individual's general ability, specific aptitudes, achievement, and values, and transforming the resulting test score data into estimates of the average grades a student would most probably receive in courses in each of seven or eight specific vocational curriculum areas as well as in vocational and academic subjects as a whole. The V.P.I. programs are designed to be administered to students in grades 8 through 13 to assist them with the choices they must make at various points are intended to help meet the vocational counselor's need to find new and more effective means of counseling students through access to information that is particularly relevant and that, furthermore, is integrated in such a way as to free more of his time for the counseling task itself.
   The following areas are measured:
   1. General academic
   2. General Vocational
   3. Business
   4. Mechanic and Mechanical Maintenance
   5. Drafting and Design
   6. Metal Trades
   7. Homes Economics and Health
   8. Construction Trades

9. Electronics and Electrical Trades
10. Agriculture

Other information that should be considered along with the results of the V.P.I. are the student's post achievement record; his work experience; his scores on measures of ability, interests, and other traits; his goals and motivation to achieve them; and so on.

The V.P.I. should help students make more appropriate choices both directly, by providing a look in advance at the grades that they most probably would achieve were they to pursue various courses of study and indirectly, by making them more aware of the actual process of making vocational choices.

WHAT ARE THE STEPS IN THE IMMEDIATE IMPLEMENTATION OF OCCUPATIONAL ORIENTATION?

The suggestion was made previously that the extent of materials and facilities required for Occupational Orientation could not be responsibly identified until the program began to mature. This is true, but immediate steps must be taken to prepare for the forthcoming year. Five publications have been identified which provide a comprehensive listing of printed materials in individualized form. Two steps must be taken immediately.

A testing program must be adopted before school begins. Instruments must be selected and purchased. Some suggestions are contained in the Teacher's Handbook. Most schools currently have testing programs. If the existing programs meet any or all of the requirements stated herein, they may be substituted in part or in total. *The need cannot be over stated for a testing program to provide each student with objective data about himself or herself.*

Additionally data must be provided about occupations. A comprehensive library of printed and audiovisual materials is part of a sound program. The bibliography lists typical materials which should be screened. Items which best assist in achieving the objectives of Occupational Orientation should be purchased and made a part of every program. For this forthcoming school year, there are five publications which identify a large volume of free and inexpensive materials. These publications are the Occupational Outlook Handbook, the Educators Guide to Free Guidance Materials, the Encyclopedia of Careers, Occupational Literature, and NVGA Bibliography of Current Occupational Literature. These five, and/or others known to instructors and administrators, are recommended for immediate purchase. While waiting for their arrival, a form letter similar to the one suggested in Appendix H should be printed in volume on school letterhead. When the books arrive a wide variety of free and inexpensive material should be requested or ordered. If both steps are taken immediately much of the material will be available for the exploration in the first category.

SOURCES OF FREE AND INEXPENSIVE MATERIALS

Forrester, Gertrude. Occupational Literature, 5th ed. New York: H. W. Wilson Company, 1964.

Hopke, William E. Encyclopedia of Careers and Vocational Guidance, Vol. II. Chicago, Illinois: J. G. Ferguson Publishing Company, 1967.

National Vocational Guidance Association, Career Information Review Service. NVGA Bibliography of Current Occupational Literature, 4th ed. Washington, D. C.: American Personnel and Guidance Association, 1966.

Saterstrom, Mary H., and Joe A. Steph, eds. Educators Guide to Free Guidance Materials, 7th ed. Randolph, Wisconsin: Educators Progress Service, 1968.

United States Department of Labor. Occupational Outlook Handbook, rev. ed. Washington, D. C.: Superintendent of Documents, U. S. Government Printing Office, 1969.

UNIT 1
INTRODUCTION

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

Sponsored by the
DIVISION OF VOCATIONAL AND TECHNICAL EDUCATION
STATE DEPARTMENT OF EDUCATION
Jackson, Mississippi

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INTRODUCTION

QUESTIONS CONSIDERED IN THIS UNIT:

1. What is Occupational Orientation?
2. What is the "world of work"?
3. How wide is the range of employment conditions?
4. How are people paid for the work they do?
5. What is meant by "groups of work"?
6. How can the world of work be broken down for study?

OBJECTIVES

The objectives of this unit are for the student to:

1. Understand how the course is to be taught.
2. Know what the world of work is and some trends within it that might affect his occupational choice.
3. Understand the wide range of working conditions and how this range affects occupational choice.
4. Learn the different methods by which people are paid.
5. Understand Roe's schema as a method of dividing the world of work into study-size groups.

I. WHAT IS OCCUPATIONAL ORIENTATION?

Occupational Orientation is a course designed to help the student explore the world of work: its conditions, its requirements, and its rewards. Occupational Orientation has as its purposes:

A. To provide students with sound bases for making career choices.
B. To provide students with a general knowledge of the world of work and work requirements.
C. To assist students in self-assessment: to understand their individual attributes as well as their limitations and how these relate to occupations.
D. To provide students with information about clusters of occupations in eight interest categories.
E. To assist students in determining which occupations can best meet and satisfy their needs.
F. To assist students in understanding the importance of the high school curriculum.
G. To provide students with a knowledge of the importance of all occupations to our economy.
H. To assist students in understanding the broad range of occupations and of occupational requirements.

MATERIALS TO BE COVERED

This course is to explore many occupations in which people earn their living. Occupations will be discussed in groups. Each student will study individual occupations that interest him. There are several things about an occupation that an interested person should know. The duties of the occupation, the type businesses or organizations where it is found, the amount of pay, and the conditions under which the work is performed are important and will be covered. Equally as important to a person interested in a particular occupation are: what is required of a person entering the occupation, methods of entering it, opportunities for advancement, the employment outlook, and what mental and physical characteristics should he have.

METHODS TO BE USED

The teacher will present some information to the class as a group, but the student will spend the majority of his time individually or in small groups viewing films, reading, and performing laboratory activities. This places much of the responsibility on the student. He must be willing to study and progress on his own without constant supervision.

Tour the laboratory and classroom. Point out assigned instructional areas, specialized equipment, and audio-visual equipment. Demonstrate any audio-visual equipment to be used in individual or small group instruction.

II. WHAT IS THE "WORLD OF WORK"?

The "world of work" is a name commonly given to that part of our society in which we earn all or part of our living. Everyone who works at anything for which he is paid is a part of the world of work. The newspaper boy delivering papers for his first-earned money, the president of a large corporation, and everyone in between who works are all a part of the world of work.

REASONS FOR WORKING

If you asked most people "Why do you work?", they would say, "For pay." Most of us have to work for the money necessary for food, housing, etc., but we also work for other reasons.

Some people work at a particular job for the status it affords them, for the standing it gives them in the eyes of the community. Self-esteem is closely related to this. When one enjoys self-esteem as the result of working he enjoys a feeling of personal accomplishment. This is as important to most people as the standing they have in the community.

Another reason people work is the self-satisfaction they get from it. Very few people would be happy at any job or activity without a feeling of having accomplished something and being satisfied with their own performance.

THE WORK ETHIC

To most people in America today, working is considered good and not working bad, or even some kind of sin. This has not always been true.

In ancient Greece and Rome work was considered evil. The gods hated man and forced him to work out of spite. Slaves were kept to do the work because work has a curse. No man who could avoid it did any physical work.

Later in medieval Europe it was thought that working was carrying out God's purpose in life. This concept was broadened and modified by the early American settlers. In America now most people believe that it is every man's obligation to work, to do his part for himself and society.

WOMEN IN THE WORK FORCE

Workers and the composition of the work force in this country are constantly changing. Fifty years ago there were relatively few women working outside the home. Today, one-third of all the workers in this country are women.

Very few teenage girls work; however, they enter the labor market in large numbers in their early twenties. Most quit working within a few years to get married and rear a family. By the age of thirty-five they are beginning to return to work. At forty-five many have returned to the job. About one-half of the women in this country between the ages of 45 and 54 are working. It is interesting to note that the average American girl can expect to work twenty-five years of her life.

There are many reasons for the increase of women in the work force. Probably two of the main ones are the technological changes that have made work lighter, both in industry and in the home, and the fast growth of service (nonproduction) occupations in which women play an important role.

CHANGES IN TYPE JOBS AVAILABLE

There have been many important changes in the places people work since the turn of the century. One of the most important changes has been the shift from farm to non-farm occupations. In 1900 about one in every three workers in this country worked on a farm. Today less than one in every ten workers are farm employed and the percentage is expected to continue dropping.

Also important is a change in the type work done by non-farm workers. Manufacturing has increased its output per man so rapidly that is now takes a smaller percentage of the population to manufacture sufficient goods than at any time in history. By 1950, and for the first time in history, our nation had more people working in service-producing occupations than in goods-producing occupations.

Automation has been, and will continue to be, an important influence on occupations. As machines are invented to do more and more work, the people who do this work are displaced. Those usually displaced by machines are the unskilled and semi-skilled workers. As these jobs disappear more skilled and technical jobs are created. Therefore, a greater percentage of our workers than ever before is highly trained.

SIGNIFICANT TRENDS IN EMPLOYMENT

A boy graduating from high school now can expect to spend more than forty years in the work force. The average high school girl can expect to work twenty-five years. With these figures in mind, it is apparent that the future of the world of work should be very important to young people.

In a recent year one million young people reached the age of eighteen. Most of them, and those in succeeding years, will soon be entering the labor market. This great number of workers, all applying for the same job, is going to make the world of work very competitive.. Competition plus the fact that unskilled jobs are disappearing is going to make more education and training a requirement.

The shift from goods-producing occupations to service-producing occupations and the elimination of more and more blue collar jobs are rapidly increasing the percentage of white collar workers.

The location of vast numbers of jobs is changing. Before World War II there was a large concentration of non-agricultural jobs in the New England States and the states around the great lakes. Since World War II there has been a large shift in the location of these jobs. The trend seems to be to the west and south. One out of every six jobs is now located in just three states – Texas, Florida, and California.

Business and industry are becoming more automated. Complicated machinery and computers are being developed which will displace even more workers. This trend will eliminate many production-type jobs, but it will create technical and white collar ones.

Ask someone from the local office of the State Employment Service to speak to the class on employment trends in Mississippi.

Make a transparency of the chart on the following page and use it in answering questions V and VI.

III. HOW WIDE IS THE RANGE OF EMPLOYMENT CONDITIONS?

The range of employment conditions is very wide. Construction laborers work largely outdoors in weather from extremely hot to cold. They often work in muddy or dusty conditions. The work is often very hard. It usually consists of loading, moving, stacking, and placing heavy materials.

At the other extreme, a secretary works under all together different conditions. She may work in an airconditioned office with carpeting and piped-in music. Her work is rarely, if ever, strenuous.

Each job has a set of conditions under which it is performed. It is important for young people exploring the world of work to learn the working conditions of different occupations. These should then be compared with the type conditions under which they would like to work.

	I Service	II Business Contact	III Organization	IV Technology	V Outdoor	VI Science	VII General Cultural	VIII Art And Entertainment
1	Lawyer Counselor	Promoter	Industrial Tycoon Economist	Chief Engineer	Archaeologist Geologist	Research Scientist Medical Specialist	Supreme Court Justice College Professor	Artist Architect
2	Social Worker Probation Officer	Public Relations Specialist Manufacturer's Salesman	Certified Public Accountant Hotel Manager	Factory Manager Computer Programmer	Forester Surveyor	Nurse Veterinarian	Editor High School Teacher	Athlete Designer
3	Detective Welfare Worker	Automobile Salesman Insurance Salesman	Bank Teller Restaurant Manager	Pilot Radio Operator	Farm Owner Game Warden	X-Ray Technician Chiropractor	Radio Announcer Reporter	Ad Writer Interior Decorator
4	Barber Policeman	Auctioneer	Cashier Receptionist	Electrician Mechanic	Miner Oilwell Driller	Technical Assistant Practical Nurse	Law Clerk	Photographer Racing Car Driver
5	Taxi Driver Waiter	Peddler Routeman	Typist Mail Carrier	Bulldozer Operator Truck Driver	Farm Tenant Painter			Stage Hand
6	Elevator Operator Watchman		Messengerboy	Laborer Meter Reader	Farm Laborer			

*Anne Roe. The Psychology of Occupations, New York. John Wiley and Sons, Inc.

IV. HOW ARE PEOPLE PAID FOR THE WORK THEY DO?

Wage payment practices are quite different now from what they have been in the past. During the early years of the apprenticeship program a boy was indentured to and worked for a craftsman for up to eight years. During this entire period he worked hard and long hours for no pay except room and board. Until fairly recently in America farm boys and girls worked for their parents for no pay. An "allowance" was never in question because in those days they had never heard of it.

Economic development, child labor laws, and the minimum wage laws have brought about great changes in wage payment practices. The move away from the farm and the modern trend for more people to work for large businesses has largely eliminated the need for young people to work extensively at home. Federal law now states that people working in most businesses must be paid a minimum amount.

In our modern stage of economic development people are paid by several methods for their work. Most blue collar workers work for an hourly wage. Many people in manufacturing assembly-line jobs are paid on a piece-work basis; i.e., they are paid by the number of times they do a certain thing. Many sales people are paid by commission. This means they receive a certain percentage of the selling price of everything they sell. Professional people and government workers are usually paid a certain amount per month.

V. WHAT IS MEANT BY "GROUPS OF WORK"?

In this class, we will use the term "groups of work" quite often. In the world of work people have roles that require different degrees of responsibility and of education. We will call those occupations with major responsibility and much education, such as large corporation presidents, Group I. Unskilled laborers will be called Group VI, and all other workers will be classified in between.

This method of grouping is related to amount of education. Generally, those occupations that require extensive education are in Groups I and II. Those that require little education are in Groups V and VI.

Group I requires as a minimum a bachelor's degree for entrance into the occupations. For those who hope to advance to positions of greater opportunity and responsibility, graduate work is almost a necessity. Experience, personal interest, drive, and training are other prerequisites for advancement in these occupations.

A bachelor's degree is usually required for entry into the occupations in Group II. Some of the occupations in this group require special examinations and special training for advancement and, in some cases, entrance. Other advancement prerequisites are experience, interest, and preparation. Often those who advance in these occupations come up through the ranks of the organization in which they are employed.

In Group III a high school education is required for entrance and a college degree are preferred by some employers. Additional training is important in advancing in these occupations as well as experience and initiative.

Group IV requires at least a high school education. As in the other groups, experience is important for advancement. Included also are ability, seniority, educational training and specialization, and skill.

Certain high school courses relating to the specific occupations are important for entering Group V. A high school education is preferred but not always required. Some of the occupations, such as checkout cashier, require involvement in a special training course for entrance and advancement. Again, experience, initiative, skill, ability, and educational training, as well as job performance and the size and type of the place of employment, usually dictates advancement in these occupations.

Occupations in Group VI do not require a high school education, but, again, some employers prefer this when choosing their employees. As in all of the other groups, the same points – educational training and specialization, experience, and the type of firm – usually are considered in choosing employees to be promoted.

VI. HOW CAN THE WORLD OF WORK BE BROKEN DOWN FOR STUDY?

We are going to divide all the occupations in the world of work into eight categories. Each occupation is assigned to a category according to its interest focus. By interest focus we mean the one facet about an occupation in which most people in that occupation are interested.

For example, the first category is service occupations and includes occupations concerned with serving other people. The occupation "social worker" is in this category because a social worker is constantly helping others. A list of the eight categories and a short explanation of each follows:

I. SERVICE. These occupations are primarily concerned with serving and attending to the personal tastes, needs, and welfare of other persons. Included are occupations in guidance, social work, domestic, and protective services.

II. BUSINESS CONTACT. These occupations are primarily concerned with the face-to-face sale of commodities, investments, real estate, and services. Also included are such occupations as demonstrator, auctioneer, and certain agents. A distinction is made between those sales occupations in which the job requires personal persuasion, which belong in this category, and those in which the selling is routine and the person-to-person relationship relatively unimportant, which belong in the next Group.

III. ORGANIZATION. These are the managerial and white collar jobs in business, industry, and government, the occupations concerned primarily with the organization and efficient functioning of commercial enterprises and of government activities.

IV. TECHNOLOGY. This Group included occupations concerned with the production, maintenance, and transportation of commodities and utilities. Here are occupations in engineering, crafts (including repairwork), and the machine trades, as well as transportation and communication. Whether a physical scientist belongs in this Group or in Group VI depends upon the setting in which he is working.

V. OUTDOOR. This Group includes agricultural, fishery, forestry, mining, and kindred occupations: the occupations primarily concerned with the cultivation, preservation and gathering of crops, of marine or inland water resources, of mineral resources, of forest products, and of other natural resources, and with animal husbandry.

VI. SCIENCE. These are the occupations primarily concerned with scientific theory and its application under specified circumstances other than technology.

VII. GENERAL CULTURAL. These occupations are primarily concerned with the preservation and transmission of the general cultural heritage. This Group embraces occupations concerning the subjects usually called the humanities in college catalogs, but it is broader than these, It includes occupations in education, journalism, jurisprudence, the ministry, linguistics, etc. All elementary and high school teachers are included in this Group. At higher levels teachers of science and are are placed in Groups VI and VIII.

VIII. ARTS AND ENTERTAINMENT. These occupations include those primarily concerned with the use of special skills in the creative arts and in the field of entertainment. Both creators and performers are included.

UNIT 2

SERVICE CATEGORY

PRELIMINARY DRAFT

Prepared by the
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for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

Sponsored by the
DIVISION OF VOCATIONAL AND TECHNICAL EDUCATION
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SERVICE CATEGORY

STUDENT OBJECTIVES

1. To be prepared to write a brief definition of the term "service", and to list at least five occupations that are included in the service category.

2. To study carefully the content of this manual in order to be able to tentatively select one or more occupations for detailed study.

3. To become involved in at least one realistic experience pertaining to each of the occupations tentatively chosen.

4. To be able to list three occupations in the service category that you liked the most, and to write at least one reason why you found each interesting.

5. To be able to identify at least three occupations that you like the least, and to write at least one reason why you dislike these occupations.

6. To be able to identify and list your special interests that would help in meeting requirements for success in occupations in the service category.

7. To be able to identify and list your special abilities that would help in meeting requirements for success in occupations in the service category.

8. To be able to identify personal limitation that may prevent success and satisfaction in occupations in the service category.

TEACHER OBJECTIVES

1. To spend as much time as necessary to prepare students for the service category by reviewing test interpretation and keys to self understanding, and by dealing individually and as a group with problems that may have arisen.

2. To identify what the students know about service occupations before beginning the unit by giving a short test.

3. To define the term "service" and to characterize it by using illustrations and examples.

4. To acquaint students with service occupations by duplicating a printed list with short explanations, and passing these to the students for study and reference.

5. To show the students, on a screen, or by duplicating and passing out printed lists, how occupa-

tions can be grouped according to amount of education and skills required, and the degree of responsibility one must assume.

6. To show the students how occupations in the service category can be grouped by industries, families, and units of economic activity; to compare these occupations with each other.

7. To involve the students with in-class and out-of-class activities that will help them see the evidence, and importance, of service occupations within their community.

8. To lead the students in a brief study of the nature of the work in service occupations, where employment is found, education and skills required for entry and advancement (in these occupations), earnings, trends, and employment outlooks.

9. To lead the students in the study of typical personal requirements to be successfully employed in these occupations; to involve students in activities that will aid them in measuring their own personal traits and abilities in relation to these requirements.

10. To provide the opportunity for students to choose one or more occupations in the service category and make a detailed study of it through the use of filmstrips, films, occupational briefs, career books, etc.

11. To provide students with realistic experiences that pertain to the service category.

12. To provide students with any educational and occupational information needed to intelligently plan a career choice.

WHAT IS MEANT BY THE TERM "SERVICE" AS APPLIED TO OCCUPATIONS TO BE STUDIED IN THIS CATEGORY?

Students were helped to appraise their personal characteristics, interests, aptitudes, abilities, and achievements at the beginning of this course of study. If this unit is far removed from the evaluation, there will be a need for review with particular emphasis on desirable occupational characteristics, interests, aptitudes and abilities.

These are occupations in which the principal activity is to attend and serve the personal tastes, needs, and welfare of others. Persons in these occupations are generally inspired by humanitarian motives to work for human betterment through personal assistance. Such occupations are classified in the service category. Included are occupations in guidance, social work, and domestic and protective services. People in these occupations are generally doing something for or to someone.

Ask the student to give examples of experiences in which they have done something for or to someone that would relate to the definition of the term "service".

Identify examples of occupations that require varying degrees of skills in attending and serving the personal tastes, needs, and welfare of others.

A questionnaire-comment type form should be prepared for use in determining what the students know about the occupations listed in the service category (see appendix A for a sample form). This will be of immediate value in assisting the student in occupational exploration and in evaluating his later learning.

HOW ARE OCCUPATIONS IN THE SERVICE CATEGORY CLASSIFIED?

Review Roe's description of the six groups. Give the students a reference list of the service occupations, along with a brief description of each. The brief description is for student use and will help eliminate complete lack of knowledge of certain occupations.

CLASSIFICATION ACCORDING TO DEGREE OF RESPONSIBILITY AND EDUCATION

GROUP I

a. Lawyer – advises people of legal rights and obligations, represents them in courts of law, negotiates settlements out of court; acts as trustee, guardian, or executor.
b. Physician – diagnoses diseases and treats people who are ill or in poor health.
c. Psychologist – studies the behavior of individuals and groups, seeking to understand people and to explain their actions.
d. Veterinarian – diagnoses, treats, and controls numerous diseases and injuries among many species of animals.

GROUP II

a. Agricultural extension worker – engages in educational work in agriculture, home economics, youth activities, and community resource development.
b. Caseworker – identifies the social problems of individuals and families through interviews; aids them in understanding their problems and in securing necessary services.
c. Child welfare worker – improves the physical and emotional well-being of deprived and troubled children and youth.
d. Counselor, rehabilitation – helps handicapped persons make a satisfactory occupational adjustment.
e. Counselor, school – helps with the personal and social adjustment of students and aids in the prevention or correction of problems that may interfere with their success; advises in educational and vocational decisions.
f. Counselor, vocational – helps people develop and accept an adequate career goal which will use the individual's potential and bring personal satisfaction.
g. FBI agent – investigates many type violations of federal laws such as bank robberies, sabotage, or kidnapping.
h. Home demonstration agent – works closely with women in home management and nutrition.
i. Librarian – records and makes information widely available; selects and organizes collection of books, pamphlets, periodicals, films, etc.
j. Minister – leads congregations in worship services; delivers sermons, and gives talks, performs marriages, and conducts funerals.

k. Mortician – arranges and directs funeral services.
l. Nurse, RN – cares for ill, injured, convalescent, and handicapped persons in hospitals, clinics, private homes, sanitariums, and other institutions.
m. Occupational therapist – plans, organizes, and participates in direct educational, vocational, and recreational activities designed to help mentally and physically disabled patients become self-sufficient.
n. Physical therapist – help persons with muscle, nerve, joint, and bone diseases or injuries to overcome their disabilities.
o. Priest – attends to spiritual, moral, and educational needs of the members of his church. Duties include offering the Sacrifice of the Mass, and hearing confession.
p. Psychologist
q. Rabbi – leads the worship services of their congregation, and teaches and interprets Jewish law and tradition.
r. Social worker, community – helps plan and develop health, housing welfare, and recreational services for a neighborhood or a larger area.
s. Social worker, group – helps people through group activities learn to understand themselves and others better, and work with others to achieve a common goal.
t. Social worker, school – helps children whose unsatisfactory behavior is related to their social problems.
u. Social worker, medical – employed by hospitals, clinics, health agencies, rehabilitation centers, and public welfare agencies to aid patients and their families with social problems accompanying illness, recovery, and rehabilitation.
v. Teacher, elementary – Normally works with one group of pupils during the entire day, teaching several subjects and supervising various activities, such as lunch and play periods.
w. Teacher, kindergarten – conducts a program of education for young, pre-elementary school children.
x. Teacher, secondary – teaches junior and senior high school students, and usually specializes in a particular subject.
y. Teacher, special education – teaches the handicapped and other students with special needs.
z. Travel agent – plans, arranges, and sells travel accommodations.
aa. Placement officer, college – provides information about occupations and job openings to students, and helps evaluate their special abilities and job opportunities.

GROUP III

a. Nurse, RN
b. Travel agent
c. Policeman – helps to preserve law and order by preventing criminal activities, investigating crimes, and by apprehending and assisting in the prosecution of offenders.
d. Policewoman – works with women and youth in such activities as locating lost children, and searching, questioning, booking, and fingerprinting women prisoners.
e. Steward, airline – man who helps to make air flights safe, comfortable, and enjoyable.
f. Stewardess, airline – woman who helps to make air flights safe, comfortable, and enjoyable.
g. Housekeeper, home – manages a house, such as a governor's mansion, where there is a large staff of other household employees.

GROUP IV

a. Barber – cuts hair in accordance with the preference of each customer; also provides services related to care of hair, scalp, and face.
b. Beautician – provides a variety of beauty services, most of which are related to the care of hair.
c. Cook, restaurant – prepares, seasons, and cooks soups, meats, vegetables, desserts, and other foodstuff.
d. Policeman
e. Policewoman
f. Practical nurse – works under the direction of physicians and professional nurses and assists in caring for medical and surgical patients, convalescents, handicapped people, and others who are physically or mentally ill.
g. Steward, airline
h. Stewardess, airline
i. Recreation worker – helps people enjoy and use their leisure time constructively by organizing individual and group activities and by administering physical, social, and cultural programs for all age groups at camps, playgrounds, and community centers.

GROUP V

a. Cook, restaurant
b. Firefighter – participates in many different kinds of firefighting activities, helps people to safety, administers first aid, and helps in preventing fires.
c. Service station attendant – greets customers, inquires about their needs, and performs a variety of services for the customers, ranging from pumping gas to giving street directions.
d. Taxi driver – provides passenger transportation within a community; assists passengers in and out of the cab, and handles baggage.
e. Waiter – man who works in restaurants taking customers' orders, serving food and beverages, and making out customers' checks.
f. Waitress – woman who works in restaurants taking customers' orders, serving food and beverages, and making out customers' checks.
g. Housekeeper – supervises work activities of cleaning personnel to insure clean, orderly, and attractive rooms in motels, hospitals, and similar establishments.

GROUP VI

a. Bellhop – carries the baggage for incoming hotel guests, escorts them to rooms, and sees that everything in the room is in order.
b. Nurses' aid – works under the direction and supervision of registered professional nurses and licensed practical nurses, and performs such services as answering call bells, serving meals, making beds and bathing or dressing patients.
c. Orderly – man who performs the same duties as nurses aid.
d. Waiter
e. Waitress
f. Cook's helper – prepares vegetables and meats and does other work for cook.

Note:

Certain occupations, such as psychologist, registered nurse, and waitress, appear in more than one level. They are classified in this manner because of the amount of education and/or experience acquired by those who are engaged in such occupations. Those at the higher level assume more responsibility and may be supervising or directing activities of others in the same occupation.

Select a film to show to the class that portrays duties and pertinent information about service work. Whenever possible, show a film that is representative of several service occupations. Some films to select from are listed in the appendix of this unit.

HOW CAN THESE OCCUPATIONS BE CLUSTERED?

A full characterization of each of the foregoing occupations is beyond the ability or intent of this publication. A brief description at this time should serve to orient students for later exploration. The foregoing occupations are regrouped by parent agencies or geographical locale. Several sentences on each regrouping describes essential features such as the importance of the occupation, training, and education required, and the occupational outlook. The Occupational Outlook Handbook gives much detail on all the following.

Select a film to show to the class that portrays duties and pertinent information about service work. Whenever possible, show a film that is representative of several service occupations. Some films to select from are listed in the appendix of this unit.

Arrange for resource people who are representative of the above industries to speak to the class. For example, a hospital administrator would be qualified to impart a broad range of occupational information related to hospital and clinical work.

Involve the students in developing study displays of the industries and occupations within these industries. Acquire pictures from magazines, pamphlets, newspapers, etc., showing workers in service occupations, where they work and who they are serving. Mount on the bulletin board, or on cardboard. Develop captions showing the relationship of these occupations to each other and their importance to the community and society.

Have students find information about service job opportunities and beginning salaries from want ads in the newspapers. Display this information on the bulletin board.

Analyze the yellow pages of the local telephone directory for possible location of occupations related to the service category.

CITY, STATE, FEDERAL GOVERNMENT

Lawyer,
F.B.I. Agent,
Policeman,
Fire Fighter

Most lawyers are in private practice; however, the Federal government and local and State governments employ many on a salary basis.

Protective service workers (policemen, F.B.I. Agents, fire fighters) are needed to help safeguard lives and property. Most are government employees, but some work for hotels, stores, and other businesses. Fire fighters work mainly for city governments.

Training and skill requirements differ greatly among the various occupations. F.B.I. agents must have a college degree. Lawyers must have approximately seven years of college, and have passed the Bar examination, for qualification to practice. Policemen and full-time, paid employees of city fire departments must pass a local civil service examination. After appointment, they are given several weeks of training. In most departments, applicants must have at least a high school education. The job of the policeman is becoming more demanding, and police departments are placing increasing emphasis on post-high school training in subjects such as sociology, psychology, and minority group relations.

Caseworker,
Child Welfare Worker,
Community Social Worker,
Group Social Worker

There are many people in our nation, particularly in urban areas, who cannot or will not provide for themselves or solve their own problems. These problems include poverty, broken homes, physical, mental, and emotional handicaps, racial tensions, unsatisfactory housing, and medical care. Social service workers have the task of trying to "bridge the gap" by identifying these needs and helping these people help themselves.

Most social service workers are employed in State, county and city government agencies. Some work in private agencies or do voluntary work through religious organizations. A few are serving in foreign countries.

A college degree is necessary for beginning jobs in social service work. In most states, beginners must pass a written examination for employment in a government agency.

There will be ample employment opportunities during the 1970's for social workers. In fact, the demand is expected to exceed the supply. This may be verified by indications of increasingly severe problems for many unskilled workers; family life will be affected by social change; and population will increase.

Agricultural Extension Worker,
Home Demonstration Agent

Extension service workers are engaged in educational work in agriculture, home economics, and youth activities. They help people analyze and solve their farm and home problems. They are employed jointly by the state land-grant universities and the U. S. Department of Agriculture, and are located in nearly every county in the United States. Heavily populated counties may have more than one employed in each occupation.

Beginning positions in these occupations require a bachelor's degree in agriculture or home economics. The demand for people in these occupations is expected to increase, particularly in depressed areas.

HOSPITALS, CLINICS

Physician,
Psychiatrist,
Veterinarian,
Occupational Therapist,
Physical Therapist,
Psychologist,
Nurse

Nurses and physicians constitute a large number in the health service occupations. There are more than 620,000 registered professional nurses employed in hospitals, clinics, laboratories, nursing homes, industrial plants, public health agencies, mental health centers, and private offices. Large numbers work as practical nurses, orderlies, nursing aids, hospital attendants, and psychiatric assistants.

Many women are employed in the health service occupations. Registered professional nursing, the largest of the health service occupations, is second only to teaching as a field of professional employment for women. Other health service occupations in which women predominate are occupational therapist, practical nurse, and hospital attendant. On the other hand, the majority of physicians, veterinarians, and psychiatrists are men.

The educational requirements for work in the health service occupations are as diverse as the occupations themselves. Physicians, psychiatrists and veterinarians must complete a number of years of preprofessional and professional college education and pass a state licensing examination. On the other hand, nurses' aides and orderlies may be employed with little specialized training.

A continued rapid expansion of employment in the health service occupations is expected through the 1970's, although the rates of growth will differ considerably among individual occupations. The factors which contribute to the expansion are the following: the country's expanding population; wider health education and the resulting rising health consciousness of the general public; growth of coverage under prepayment programs for hospitalization and medical care, including medicare; and increasing expenditures by Federal, State, and local governments for health care and services. In addition, many women leave the field.

SCHOOL:

Teachers

Teaching is the largest of the professions. No other profession offers so many employment opportunities for women. Women teachers far outnumber men in kindergarten and elementary schools and almost as many are teaching in secondary schools.

The employment outlook for teachers will depend upon the number of students enrolled in the schools, the diversity of curriculums offered by the schools, and the student-teacher ratio. Everything indicates an increasing demand for teachers in most fields for years to come. New classrooms are being built and there will have to be replacements for the large numbers leaving the profession.

All states require teachers in the public schools to have a certificate. Most states require four years of college preparation, including a number of professional education courses. Some school systems have higher educational requirements.

Counselors

There are many full-time and part-time counselors employed in public secondary schools. Those working part-time usually have teaching responsibilities in the school system. Counseling services in the elementary schools are being steadily expanded, but the number of trained counselors at this level is still small.

The majority of counselors are in large schools. However, many small schools are providing this service by assigning several schools to a counselor. State, community, and private employment agencies employ many vocational counselors. About one-half of all high school counselors are women.

States have varied requirements for certification of counselors. Undergraduate college students interested in becoming school counselors usually enroll in the regular program of teacher education, preferably taking additional courses in psychology and sociology. A counseling certificate usually requires graduate level work and from one to five years of teaching experience. Counselors in public employment offices must meet state civil service or merit system requirements.

Employment opportunities for the well trained counselor is expected to be very good. In 1969, the supply of qualified counselors was inadequate to meet the existing demand, particularly in public secondary schools.

This imbalance is due to the growth in school enrollments and the obvious need and desire to strengthen the counseling service. Also, recent Federal legislation has extended support of counseling services to elementary schools, vocational and technical schools, junior colleges, and to those who are out of school and seeking employment or training.

Librarians

Most librarians (about 80 percent) are women. Men are more frequently employed in administrative positions.

Librarians work in schools, public libraries, colleges, and universities, and special libraries, such as those in government agencies. Most are employed full-time, but a large number of partly trained and part-time people work as librarians.

A college degree is necessary for most library work. Most states require school librarians to be certified. Experience and graduate study is vital for the better positions.

There is presently a shortage of qualified librarians. There will be excellent employment opportunities in most parts of the country and in all types of libraries.

RESTAURANTS, HOTELS, MOTELS, AND HOUSEHOLDS:

Cooks,
Waiters,
Waitresses

Most of the workers are employed by restaurants, but large numbers are employed in hotels, private clubs, manufacturing plants, and schools.

Most workers in these occupations are women. Three out of every five cooks are women, and about seven out of every eight waiters and waitresses are women.

Most of these employees acquire their skills through on-the-job training. This is normally of short duration and may or may not be formal. Cooks sometimes acquire their skills as kitchen helpers, or through apprenticeship programs under trade union contract. Work in small eating places may require little or no preparation or training and/or experience, whereas larger eating establishments may demand much more.

The demand for workers in these occupations will be excellent during the 1970's. This can be contributed to the opening of many new restaurants, hotels, and other establishments, and the increasing number of people eating out for various reasons.

Many beginning jobs will be available. Those aspiring to better jobs will find the competition keen in the larger and more formal establishments.

PRIVATE HOMES

Maids,
Cooks,

Butlers,
Housekeeper,
Babysitter

Private household work is one of the largest areas of work for women. Most are employed as maids of various kinds. Other household workers include babysitters, cooks, companions, and butlers. Nearly half of all household workers are employed in the South; most of the rest are evenly divided between the North Central States and the Northeastern states and only about 10 percent are in the West. About three-fourths of all household workers are in city areas.

For most household workers, there are no formal educational requirements. The ability to do the work may be acquired on-the-job and through experience. Home economics courses offered in high schools, vocational schools, and junior colleges, as well as training courses sponsored by Federal agencies, State employment service offices, and local welfare departments, are helpful in developing home service skills beyond the level ordinarily reached in the home.

CHURCH, SYNAGOGUE

Minister,
Priest,
Rabbi

There are more than 264,000 people serving as ministers of churches composed of more than 225 protestant demoninations. More than 5,000 rabbis serve followers of the Jewish faith. About 59,000 priests are serving those of the Catholic faith in the United States.

Most serve individual congregations; some are engaged in missionary activity in the United States and in foreign countries; others serve as chaplins in the armed forces, in hospitals, and in other institutions; and still others teach in educational institutions, engage in other religious educational work, or are employed in social welfare and related agencies. There are very few women in these occupations.

The educational preparation required for entry into the protestant clergy has a wider range than most professions. Some religious groups have no formal educational requirements, and others ordain persons who have received varying amounts of training in liberal arts colleges, or Bible schools. Each demonination has its own schools of theology.

Educational preparation is much more demanding for those entering the rabbinate or priesthood. They must complete a prescribed course of study after high school at a theological seminary.

A sharp rise in church and synagogue membership has occurred since 1940. Many new churches and synagogues have been established and the number of pulpits to be filled has increased. Most demoninations need more people who desire to serve the spiritual needs of others and to lead them in religious activities.

TRANSPORTATION:

Stewardesses,
Stewards
Traffic Agents

The rapid development of transportation has greatly increased the mobility of the population, and has created many job opportunities, particularly in the aviation field. More than 21,000 stewardesses and 1,000 stewards worked for the scheduled air lines in 1969. About 80 percent are employed by the domestic air lines and the rest worked for international lines. They are usually stationed in major cities at the airlines' main bases.

There are many men and women employed as traffic agents in downtown offices, airports, banks, etc. Most are employed at transportation terminals at or near large cities.

Applicants for stewardess jobs must have at least a high school education. Most airlines give newly hired personnel several weeks of training. Some college and/or experience in related transportation occupations is preferred for the traffic agent occupation.

Taxi Drivers

In 1966, approximately 85,000 taxi drivers, including a small number of women, were employed in the taxi industry, which is made up of both privately owned cabs and fleets of company owned vehicles. There is also a large number of taxi drivers employed part-time.

Taxi drivers are an essential part of the transportation system in many cities throughout the country, but most are employed in the larger metropolitan areas.

Formal education is not generally a requirement for entry into this occupation. Individuals who want to become taxi drivers must have a special taxicab operator's license. This requires taking a rigid examination, including questions about traffic regulations and street locations.

The number of taxi cab drivers has been declining during the past decade because of increasing use of privately owned vehicles. However, there will be many opportunities for employment because of the large turnover in this occupation.

Service Station Attendants

There were approximately 360,000 gasoline service station attendants employed in 1967. There were also about 220,000 service station managers. The largest concentration of gasoline service station attendants is in the States having the largest number of vehicles.

Completion of high school is not essential for employment as service station attendants, but many employers prefer high school graduates. Many large oil companies who offer training programs for gasoline service station workers require their applicants to be high school graduates. Most employees are trained on the job, beginning with minor work assignments. Gradually they progress to more advanced work. They may eventually advance to a management role. Schools have a distributive education program provide opportunities for students to receive training for service station work.

There will be many full-time and part-time job opportunities in the 1970's for individuals who want to become gasoline service station attendants. Many transfer to other jobs, leaving vacancies. There will be more cars on the roads to be serviced, and more consumption of gasoline. New service stations will be needed. This will create a demand for many attendants.

The previous information on service occupations relates more to the national labor situation than to State or local needs and outlooks. The Mississippi Employment Security Commission, with local and central offices throughout the state, has a great deal of occupational information, including trainable occupations, numbers employed at present in each occupation, and projections for the future. The following information on service occupations was acquired from a study made in 1965 by the commission:

OCCUPATIONS	YEAR	NUMBER EMPLOYED IN STATE WITH PROJECTIONS TO 1970
Cooks, except private family	1965	3,008
	1970	3,100
Waiters and waitresses, except private family	1965	4,258
	1970	4,500
Beauticians	1965	479
	1970	829
Practical Nurses	1965	1,546
	1970	2,250

Local and center offices of the Employment Security Commission can provide information pertinent to their districts. Also, local survey results can be obtained from the Chamber of Commerce, or other industrial development groups.

Arrange for six students to participate in a panel discussion on the importance of occupations in the above industries.

Arrange for resource people representative of the above industries to speak to the class. For example, a hospital administrator would be qualified to give information related to hospital and clinical work.

Involve the students in developing study displays of industries and occupations within these industries. Acquire pictures from magazines, pamphlets, newspapers, etc., showing workers in service occupations, where they work and people they are serving. Mount these on the bulletin board, or on cardboard. Develop captions showing the relationship of these occupations to each other, and their importance to the community and society.

Have students find information about service job opportunities and beginning salaries from want ads in the newspaper. Display this information on the bulletin board.

Analyze the yellow pages of the local telephone directory for possible location of occupations related to the service category.

WHAT ARE THE TYPICAL PERSONAL REQUIREMENTS OF THOSE SUCCESSFULLY EMPLOYED IN SERVICE OCCUPATIONS?

The service category contains the people who provide personal service to others. This service is usually doing something for or to someone. Many of these occupations require application of organized knowledge to working with the problems and needs of people. Professional relationships with them are governed by established standards of competence and ethics.*

Although the approach to solving other people's problems and meeting their needs may be as different as that of the lawyer and the nurses' aide, there is a requirement throughout the service category that workers have a good knowledge of how and why humans act and think as they do. Many of the jobs require skill in spotting key facts in complicated human situations. This is particularly true of the lawyer, teacher, and counselor.*

Guidance and social workers may be required to study and deal with human problems and needs, not only in isolated cases, but also as related to a community, society, or even the world in which we live. The emphasis in some of the service occupations is on the application of technical knowledge problems and needs of people.*

Such services as those rendered by beauticians, barbers, nurses, cooks, waitresses, and taxi drivers are very much under the direction and control of the person being served. The worker may be required to subordinate himself to an employer or customer and maintain a subservient attitude. He devotes his time to waiting on others and is often economically dependent upon their tips This tends to emphasize his subordinate position and unequal social status. But, these workers may render highly esteemed services to others and derive self-fulfillment from the feeling of being valued and needed.*

For some service workers the duties are informal, unspecified, or vaguely circumscribed. Others work in institutional settings with duties strictly regulated by formal guides, schedules, and sanctions.*

Some workers must acquire finesse in catering to one personality; others must adapt to a wide variety of individuals. For some occupations, the contact with others is short-lived; other occupations require adjusting to prolonged, intimate, and daily contact with the persons being served.*

People in these occupations are rewarded by the opportunity to promote human growth and achievement. Their lives are stimulated by the many creative relationships with others which are possible. Their

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Jnited States Department of Labor. Counselor's Desk Aid stresses come mainly from the difficult problems and needs for which they are expected to commit themselves.

Service occupations which require licensing, as barbers and morticians, are entered by technical training. Specialized training is required for airline stewardesses, cooks, and most policemen. Bellhops and waitresses need only short on-the-job demonstration.*

WHAT ARE SOME CLUES TO POTENTIAL IN THE SERVICE OCCUPATIONS?

People who possess the following personal characteristics may enjoy, and find success, in the service occupations:

1. Preference of working with the problems and needs of others, rather than in an industrial or office environment
2. Willingness and capactiy to engage in professional preparation (would not be essential for several service occupations)
3. Good verbal aptitude
4. Pleasing manner and appearance
5. Dependability
6. Ability to perform under specific instructions
7. Self control and ability to perform adequately under stress (stability)
8. Ability to understand and comply with requests of people
9. Patience and courteous manner when dealing with people
10. Pleasant personality
11. The ability to put people at ease
12. Ability to relate to people at all levels
13. Quick thinking and ability to adapt to varied situations and responses
14. Patience and sympathy for problems of others.
15. Attentiveness (and ability to pay attention) to detail
16. Clean personal habits
17. Ability to achieve and maintain empathy and rapport with people
18. Sympathetic attitude toward the welfare of others
19. Tact, poise

Note:

Certain of these personal traits do not apply to particular service occupations.

There are certain traits that particular service occupations require that are not listed. However, these are inate traits which occur most frequently among those who are successfully employed in service occupations.

Devise a check list to pass to the students which permits them to evaluate themselves against these characteristics. See Appendix G.

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*United States Department of Labor, Counselor's Desk Aid

Discuss why such personal characteristics are essential for success and enjoyment in doing service work. Relate points brought out about specific occupations.

Evaluate the check list results very closely. Lead in an impersonal class discussion of the results of the check list and what it means to the students. Some individual counseling is essential and should be well planned.

Develop a check list similar to the one which follows. As the students consider each type of service, point out the degree of personal involvement and independent action required.

	Don't Know	Like	Dislike
This kind of work requires you to devote yourself to serving and helping others and to taking direct orders. You would do very little planning on your own. Such work would not take long to learn. You would do such things as serve food to others in a restaurant, trying to please them in every way; help to prepare vegetables, meats, and other food; clean an office, doing the work just as your employer wishes it done; or carry out exact orders from a medical staff.	________	_____	_____
This kind of work involves making many decisions on your own, and assuming responsibility in planning your work from day to day. It requires special skills and may require considerable specialized training. You would do such things as provide services related to care of hair, scalp and face; prepare a variety of soups, meats, vegetables, and deserts; or help make people safe and comfortable while traveling.	________	_____	_____
This is the closest type of work with people. You may work with the total personality of other people and help solve their problems. You may do for people what they cannot possibly do for themselves. This work is very demanding in the standards and professional principles it requires of you. The training time may extend several years past high school. You would do such things as help restore to health a mentally disturbed person; give spiritual comfort to sad persons in need of comfort; check and give treatment to diseased people or animals.	________	_____	_____

Note:

This check list is not to be used to force the student into making a final decision of a group to explore. In fact, it does not include all groups. Rather, it should suggest to the teacher and the student occupations in this category that are more meaningful to the student than others.

Discuss special skills required of certain service workers. Some examples would be the use of surgical instruments and equipment by the physician; equipment used by the physical therapist; and the many special agricultural related skills required of the agricultural extension worker.

HOW CAN THE STUDENTS EXPLORE OCCUPATIONS IN THE SERVICE CATEGORY?

Presentation of the content suggested thus far, and student involvement in the activities planned during the presentation, should have prepared the student to tentatively select and explore one or more occupations in the service category. The instructor should study the teacher's handbook which explains the procedure for individual exploration.

Devise a check sheet or a progress chart for use in keeping a record of what the students are doing during the individual exploration periods. Students would simply check with the teacher each time they change direction and begin exploring a different occupation. This may also be used for keeping records of all activities the students are involved in for each unit.

OCCUPATIONAL INFORMATION

This is the beginning phase of individual exploration that will enable the students to gain information on occupations that have been tentatively chosen. Be sure that the student understands where the occupational material is located and how it is to be used. Study the teacher's handbook for information on how the students may get maximum benefit from exploration of printed material, filmstrips and tapes, suggested resources, etc. See Appendix B for a suggested report form for use by the students when exploring an occupation.

Let the students make brief oral reports to the class on one of the occupations explored.

SUGGESTED ACTIVITIES

Study the teacher's handbook for descriptive information on the purpose of mock or simulated activities, instructor and student roles during these activities, and other related learning activities which can be applied to this category. Arrange for the students to be in contact with the suggested exploratory experiences contained in this manual.

1. Policeman, policewoman, FBI Agent
   a. Arrange to show the following films:
      Thin Blue Line (policeman)

The Law Enforcement Officer

Modern Talking Pictures Service, 214 S. Cleveland St., Memphis, Tennessee 38104.

b. Get permission to go on a patrol with a law enforcement officer. Through observation and questioning, find out what role the officer plays in the following services:
   1) Investigations, identifications, reporting
   2) Traffic problems
   3) Patrol
   4) Obtaining evidence
   5) Testifying

   Find out what materials and equipment are essential to his job. This would include report forms, weapons, penal codes, city maps, first aid kits, and weather and night protection equipment.

c. Read the following books:

   Sullivan, John L. Introduction to Police Science. McGraw-Hill. 1966

   Liston, Robert A. Your Career In Law Enforcement. Julian Messner. West 39th St., New York, N. Y. 10018. Price $3.95.

2. Firefighter
   a. Visit a local fire department and observe and/or ask questions to obtain the following information:
      1) What happens at the alarm
      2) Strategy of the run to the fire
      3) What size-up system or plan is used at the fire
      4) Rescue procedures
      5) Preventing spread of fires
      6) Extinguishment procedures
      7) Salvage
      8) Firefighting and rescue equipment, including fire pumps, fire extinguishers, hose, foam generators, nozzles, and ladders.
      9) Fire prevention

Spend enough time at the fire station to see one or more fire alarms and observe the activity of all concerned. Ask to try your hand at coupling a hose, loading and unloading a hose, and stretching and advancing hose. Ask for a demonstration of the use of ropes in firefighting. Ask for permission to put on the protective clothing the firefighter must wear. You may also ask them to demonstrate the procedure for raising ladders, and about safety in use of ladders.

Arrange to go to the scene of a fire to observe activities of the fire fighters, but stay at a safe distance.

b. Do the following rescue and first aid activities in the classroom
   1) Fireman's carry
      a) Get someone in the classroom to lie on the floor and act as an unconscious person
      b) Pass your hands under the armpits of the unconscious person
      c) Lift to knee
      d) Rise to standing position
      e) Place on shoulder
      f) Stand up with person on shoulder

Note: Students not physically capable of doing this exercise should be discouraged from participating as someone may get hurt.

2) Care of victims after rescue. Obtain a first aid book from the local Red Cross chapter and use the procedures suggested for treating burns and for administering artificial respiration.

c. Borrow a firefighter's manual to review. Obtain this and other reading materials from the local fire department. Also, fire prevention materials may be acquired by contacting almost any insurance agent.

3. Social Workers

a. Show one or more of the following films:

Horizons Unlimited. Modern Talking Picture Service. 214 S. Cleveland St., Memphis, Tennessee 38101.

Come Quick. Association Films, Inc. 2221 Faulkner Road, N. E., Atlanta Georgia 30324.

The Return. Vocational Rehabilitation Administration. Department of Health, Education, and Welfare, Washington, D. C. 20201

b. Identify a needy family through your local church, or obtain this information from the welfare department in your community. You will also need the following information:

1) Number of people in the family (living at home)
2) Age of members of the family
3) Number of children; age, and sex of each
4) Parents' occupations
5) Amount of income of family
6) Number of children in school
7) Where family lives

c. Do one or more of the following activities:

1) Visit and talk with members of the needy family. Make friends with them. Observe the home environment.
2) Arrange a box of canned food and carry it to these people. Observe their reactions.
3) Collect good clothing no longer needed from friends and relatives. Attempt to get clothes that will fit the family members. Take these to the family. Take time to establish a friendly relationship. Show a sincere desire to help them in any way that you can.

Should you discover a family in dire need of assistance and not getting any assistance from welfare or any other source, talk with those who work with the welfare department, rehabilititation center, church pastor, or anyone who you feel could help.

d. Read the following book:

Careers in Social Service by Kathlyn Gay (1969) If not available in the library, it may be ordered from Julian Messner, 1 West 39th St., New York, N. Y. 10018. Price $3.95.

4. Agricultural extension workers and home demonstration agents

a. Show the following film:

I Open The Door. Faron Film Foundation, 1425 N. Street, N. W., Washington, D. C. 20005 (Home Demonstration Agent).

b. Testing seed planting depth (agricultural extension worker)

1) Select several seeds. Gather such information as seed variety, soil suitable for best yields, and food nutrients and moisture necessary for proper growth. Reading materials may be obtained by contacting your county agricultural extension service or by writing the

Mississippi Cooperative Extension Service, State College, Mississippi 39762.

2) Plant the seeds at different depths and in soils of different moisture content.
3) Observe the results of the planting. This will take several days.
4) Write a two page summary of your findings, and report to the teacher.

c. Canned foods (Home Demonstration Agent)

The home demonstration agent is responsible for instructing and advising women in improving farm and family life. This includes foods, clothing, buying, child care, and home furnishing. She may do this many times by using demonstration techniques.

The homemaker and the consumer in general should know about cans, labels, and the food contained, and how to interpret this information for others.

1) Contact your local agricultural extension service office. Arrange to talk with a home demonstration agent about her work. Find out what materials are available on cans, labels, and canned foods. You may also write to the following address for materials; American Can Company, Home Economics and Consumer Service Department, 100 Park Avenue, New York, N. Y. 10017.
2) Acquire several sizes and shapes of canned foods to display while pointing out what the Federal Food, Drug, and Cosmetic Law requires to be included most conspicuously on lables.
3) Show what additional information good descriptive lables may include.
4) Tell of the advantages of canned foods.
5) Demonstrate the different methods used for opening cans (some designed into the cans).

Other projects related to the duties of a home demonstration agent that may be done by the student are as follows:

1) Table setting
2) Facts about fabrics
3) How to buy crystals
4) Caring for children
5) Preparing meals for guests

Contact the home economics teacher in your schools about reading materials on the many roles in which the home demonstration agent will be involved. She may permit students exploring this occupation to be involved in some activities in her classroom. She will have many activities to suggest for possible exploration.

5. Recreation workers

a. Arrange to spend some time at the recreational facilities at one of the following: YMCA, YWCA, Community Center, Park Commission, Church.

1) Talk with the director about satisfaction from doing such work and the problems encountered.
2) Ask to see all the facilities used in such work.
3) Observe participants in the organized activities.
4) Become active in some of the sports activities.
5) Ask to assist the director in planning and organizing recreational activities for those your age.
6) Ask to borrow reading materials on recreational work.

You may find additional reading materials in the school library or the public library downtown. Information about recreation as a career and about employment opportunities in the field may be obtained from: National Recreational and Park Association, 1700 Pennsylvania Ave., N. W., Washington, D. C. 20006.

6. Librarian
   a. Plan to spend at least an hour in the school library doing the following things:
      1) Talk with the librarian to get the following information: the work activities that are involved; qualifications necessary to be a librarian; different responsibilities librarians assume; and the special requirements of different kinds of library work. Ask the librarian to explain some of the procedures for ordering and processing materials. Ask to see special equipment and facilities used in library work, such as copy machines, special processing equipment, and audio visual aids. Observe the students who are checking the books in and out, and the procedures for doing this. Observe the manner in which the students are conducting themselves in the library, and what is required of the librarian in maintaining quiteness and order.
   b. Spend some time at the public library downtown. Notice how the facilities, equipment, and the work of the librarian differs from that of the school library.

   Note: There are also many special librarians employed in such fields as science, banking, finance, medicine, engineering, electronics, and technology. Information about careers as special librarians may be obtained by writing to the Special Libraries Association. 235 Park Avenue South, New York, N. Y. 10003.
7. Lawyer
   a. Arrange for a lawyer to come to the class to speak on the personal services that the typical lawyer has the opportunity and the responsibility of providing.
   b. Plan to go to a law firm and talk with more than one lawyer about the nature of his work, the starting salary for beginning practice, what the training requirements are, and the employment outlook.
   c. Read one of the following books: Opportunities In A Law Career. by Sheldon D. Elliott. May be purchased from: Vocational Guidance Manuals, 235 East Forty-fifth St., New York, N. Y. 10017. Price $1.97 paperbound or $3.75 library edition.

      Lawyer: Opportunities for Careers in the Legal Profession. by Talbot Smith. Available from McMillan Company, 866 Third Ave., New York, N. Y. 10022.
8. Physicians, Psychiatrists, Veterinarians
   a. Arrange to work with the science instructors in the school and do the following:
      1) Use a microscope to study animal tissue for possible disease.
      2) Test for sugar in urine.
      3) Study of bacteria
   b. Arrange to do the following activity in the classroom or at home:
      1) Apply a sterile dressing to a wound to protect it from disease-producing organisms, using the equipment and supplies called for in the following procedure:
         a) Get someone to act as the patient with a wounded arm.
         b) Wash your hands and remove sterile gauze from a package.
         c) Use sterile forceps, or any appropriate instrument, to remove sterile gauze squares from the package. Replace forceps in container.

d) Grasp the corner of the gauze without touching the center.

e) Cleanse the wound, moistening the gauze with alcohol (70 percent).

f) Apply sterile dressing by placing the gauze squares over wounded area, holding the gauze with the forceps and not touching any surface. Cover with several thicknesses of gauze.

g) Secure dressings with strips of adhesive.

h) Report on the time taken, and the treatment, and reaction of the patient.

c. Arrange to visit a hospital or clinic where one or more physicians are on duty. Ask for permission to tour the facilities, particularly the laboratory, X-Ray room, and surgical area. Observe equipment, supplies, and other articles used in the diagnosis, treatment, convalescense, and cure of patients. Arrange for an interview with one of the physicians at his convenience. If your interest is strong in this type profession, you may ask for permission to observe surgery, or other activities, at some appropriate time. This will allow you to see first hand the duties of those involved, protective measures taken, and the facilities and equipment necessary for such service.

d. Films:

I Am A Doctor. Available from Sterling Movies, U.S.A., Inc. 43 West 61 St., New York, N. Y. 10023

The Veterinarian. Available from Texaco, Inc., 3300 East Princess Ann Road, Norfolk, Virginia.

e. Read the following book: Your Career in Medicine by Alan R. Bleich, M. D. Available from: Julian Messner, Division of Simon & Schuster, Inc., 1 West 39th Street, New York, N. Y. 10018. Price $3.95.

9. Occupational Therapist, Physical Therapist

a. Arrange to visit a hospital or other institution that employs someone in planning and directing therapedic programs. Ask to observe the activities of those who are receiving therapedic treatment.

b. If interest is strong in this area, you may volunteer for duty assisting the therapist during out-of-school hours.

c. Reading materials may be obtained from the following sources:

American Occupational Therapy Association, 251 Park Avenue South, New York, N. Y. 10010.

American Physical Therapy Association, 1710 Broadway, New York, N. Y. 10019.

Also, additional reading materials in these two occupations may be found in the school or downtown library.

10. Psychologist

a. Work with the school guidance counselor in planning the following activity:

A case study of a fictitous student with a severe emotional problem as shown by very abnormal behavior; but one who, with the assistance of a psychologist in analyzing his behavior, was able to achieve satisfactory personal adjustment.

b. Interview a psychologist who may be employed in one of the following places; schools, hospitals, public health agencies, research laboratories, and business. Ask about the type of work that he or she is doing (clinical, research, etc.).

11. Nurse

Plan and conduct four of the following activities:

1) Demonstrate the steps in making a back rest for a patient
2) Demonstrate how to make a door silencer
3) Construct bed blocks: demonstrate procedure for making and using the blocks.
4) Explain the following: use of the rectal thermometer; when rectal thermometer should be used; the difference in normal temperature taken orally and rectally; the procedure for taking a childs temperature rectally; and how to record temperatures.
5) Demonstrate the proper use of the oral thermometer. Show the procedure for taking a patient's temperature, and the equipment needed for taking temperature by mouth.
6) Demonstrate the correct method of counting pulse and respiration, and the method for recording pulse and respiration (daily record)
7) Demonstrate how to do the following: make a bed with a patient in it; change bed linen; and the procedure for giving a bed bath (use a doll to demonstrate).

The following books may be acquired for information on how to plan and conduct these activities: Home Nursing and First Aid. Both books are available from any Red Cross chapter. Any book on basic nursing will substitute for these.

b. Write a three page summary of your reactions to doing these activities or use the form prepared for this purpose. Include whether you liked or disliked doing the activities and why.

c. Plan a visit to a local hospital or clinic. Talk with the nursing supervisor about the different responsibilities of nurses, opportunities for nurses, training required for the various responsibilities in the nursing field, working hours, and pay received.

d. Volunteer to work as a candy striper at a local hospital or clinic. Contact the hospital administrator, or the nursing supervisor to find out the need for such personnel, what hours you might work, and the nature of the activities in which you might become involved.

e. Acquire the following books for study:

1) Health Careers Guidebook. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Price $1.50 (send cash, check, or printing office stamps).
2) Horizons Unlimited. Available from the local medical society or the Program Services Department, American Medical Association, 535 North Dearborn, Chicago, Ill. 60610. Single copy free.
3) The Hospital People. Available from local Blue Cross Association office. Single copy free.
4) Need a Lift? Available from American Legion Department S, P. O. Box 1055, Indianapolis, Indiana 46206. Price 25c.

For information on accredited schools of nursing in the state, scholarships, and other educational and occupational information, write to the Executive Director, Mississippi Hospital Association, 4880 William Circle, Jackson, Mississippi 39206.

f. Films

1) This Way to Nursing. 20 min. available from the Mississippi State Board of Health, Division of Public Health, Box 1700, Jackson, Mississippi. Free Loan.
2) The Professional Nurse. Available from Modern Talking Picture Service, 214 South Cleveland St., Memphis, Tenn. 38101.

12. Counselors

School and vocational counseling is a necessary part of this course. The work of the counselor should be quite obvious through personal contact regularly. Discuss with the occupational orientation teacher or the counselor about employment opportunities as a counselor, personal and educational requirements, and what preparation is immediately necessary.

13. Teacher

The many roles of the teacher should be quite familiar to students due to regular contact. As for activities, planning and conducting oral reports or demonstrations would closely approximate teaching roles.

a. Talk with your teachers to learn what preparation is necessary to teach in the secondary school, the opportunities for employment in specific subject areas, and the work load of the teacher.

b. Interview an elementary school teacher and a kindergarten teacher to find out how their work roles differ from the secondary school teacher, such as the number of students in contact with, and diversity of subject matter.

c. Read the following book: Your Career in Teaching by Dorothy and Joseph Dowdell (1967). If not available in the library, it may be ordered from Julian Messner, 1 West 39th St., New York, N. Y. 10018. Price $3.95.

14. Maids and housekeepers

a. Plan to do several of the following activities:

1) Mend a pair of torn trousers.
2) Wash and iron clothes.
3) Prepare a meal for two adults and three children.
4) Wax and polish floors and furniture.
5) Answer the phone for a resident owner.

Seek the cooperation of the home economics teacher in helping you plan and conduct these activities, and in arranging for the items needed.

b. Visit the local office of the state employment service to find out employment opportunities for private-household work, working hours for the various workers, and the amount of pay received.

15. Cooks

a. Do the following activities:

1) Prepare a raw salad (four servings)
2) Prepare biscuits, using soft dough
3) Prepare soup, (four servings) using meat, extracted juices, and seasonings
4) Prepare a meat dish (four servings)
5) Prepare a dessert (four servings)

Seek the cooperation of the home economics teacher in helping to plan and conduct these activities, and in arranging for the items needed.

b. Plan a trip to a restaurant:

1) Write down a list of kitchen equipment used in this restaurant.
2) Write down a list of storage equipment for food preservation.
3) Write down the weekly food menu.
4) Write down the duties being performed by the cooks.

Plan to spend some time in the kitchen observing the work. If your interest in being a cook is strong, volunteer to assist the cook for several hours. You may also apply for part-time work during the summer months.

c. Write to the following sources for additional information:
American Hotel Association, 221 West 57th St., New York 10019.
Educational Director, National Restaurant Association, 1530 North Lake Shore Drive, Chicago, Illinois 60610.
Council on Hotel, Restaurant and Institutional Education, Statler Hall, Cornell University, Ithaca, New York 14850.

16. Waiter, Waitress

a. Plan the following mock activity:
   1) Arrange for the following items to be used in the activity: Food order blanks, table and chairs, table cloth, menus, eating and drinking utensils.
   2) Prepare the table correctly for the customer.
   3) Take an order from a customer using the order blank (student from occupational orientation class).
   4) Greet the customer as he comes in.
   5) Hand menu to customer for selection of food and drink.
   6) Assist customer in making a choice, if necessary.
   7) Take customer's order, using the order blank.
   8) Serve the food and drink to customer.
   9) Hand bill to customer when finished.
   10) Collect the money for meal.
   11) Clean the table.

b. Go to several eating places where waitresses and/or waiters are on duty. Order a meal, or you may prefer to order only a drink, a salad, or a dessert. Write a summary of your observations. Include the following:
   1) Location of each place visited
   2) Relative size of the places visited, volume of business, number of waiters and waitresses on duty.
   3) Working environment - how nice is each establishment?
   4) The type food service - short orders, take out, etc.
   5) Specialities - information usually on the menu
   6) Duties performed by the waiters and waitresses

c. Volunteer to assist in minor waiter or waitress duties at a local restaurant. This may lead to a part-time job after school hours and during the summer months.

d. Write to the following sources for additional information:
   1) Council on Hotel, Restaurant, and Institutional Education, Statler Hall, Cornell University, Ithaca, New York 14850.
   2) Educational Director, National Restaurant Association, 1530 North Lake Shore Drive, Chicago, Illinois 60610.

17. Bellhop

a. Visit the local office of the state employment service to find out about employment opportunities for bellhops. Arrange to talk with a bellhop employed at a local hotel about the nature of his duties, the work hours, pay received through tips, and methods of entering the occupation. You may also visit with the personnel manager and talk with him about the work of bellhops and bell captains.

b. Write the following source for additional information:

American Hotel and Motel Association, 221 West 57th St., New York, N. Y. 10019

18. Ministers, Priests, Rabbis

Arrange to discuss the matter of entering religious service with someone in the position to give sound advice – minister, priest, or rabbi. Become active in church service groups, such as devoting time to the sick or the aged and aiding in personel witnessing. It will be difficult to test your decision to enter the clergy without making some kind of personal committment of yourself. It will take much thought and self-study, and a firm conviction that this what you should follow as a vocation.

For further information, talk with informed persons within the church or synagogue.

19. Travel Agent

Do several of the following activities:

a. Visit a travel agency and obtain information about this type service as a career.

b. Write a two page report of actual travel experiences, including expectations, merits, and problems of travel.

c. Obtain a part-time job assisting the travel agent during peak periods, or when the agent has to be out of the office.

d. Examine various travel magazines to get a broader view of the occupation and some of the current services and new developments.

Sources of additional information:

Education and Training Department, American Society of Travel Agents, 360 Lexington Ave., New York, N. Y. 10017

National Association of Travel Organizations, 900 17th St. N. W., Washington, D. C. 20006

20. Steward, stewardess (airline)

Plan to do one or more of the following activities:

a. Visit with stewards or stewardesses employed by airline companies, or talk with those employed in airline personnel offices about the occupational requirements.

b. Obtain brochures from major airline companies and private training schools describing the work of airline stewardesses. Write the following sources for information:

Air Line Stewards and Stewardesses Association International, 55th and Cicero Ave., Chicago, Illinois 60638

Correspondence Inquiry Branch MS-126, Federal Aviation Agency, Washington, D. C. 20553

c. Obtain part-time work to gain business experience. Contribute time in community service work to get experience in dealing with people.

d. Film

The Stewardess Story. Available from Modern Talking picture Service, 214 South Cleveland Street, Memphis, Tennessee 38104

21. Taxi driver

Do one of the following activities

1) Observe a taxi driver by getting permission to ride in a taxi and by asking the driver questions about the occupation.

2) Arrange to visit the personnel director of a taxi cab company.

22. Service Station Attendant

Do one of the following activities:

1) Interview several service station attendants. Observe for an hour the duties performed by the attendant.
2) Arrange to spend some time helping the attendant around a service station.
3) Write to the following source for information:
   American Petroleum Institute, Marketing Division, 1271 Avenue of the Americas, New York, N. Y. 10020

EVALUATION

Some student and teacher evaluation tools have been suggested during this unit. There should be a culminating evaluation at this point to determine (1) the behavior changes produced by the presentation of the general information to the group and (2) the behavior changes occuring from individual exploration of specific occupations.

See appendix C for a sample evaluation questionnaire.

EDUCATIONAL PLANNING

Students have had an opportunity to look closely at their fitness for one or more occupations in the service category. However, all these occupations require preparation of some sort before the prospective worker is ready to assume his duties.

This preparation includes both general education and specialized training. The service station attendant, taxi driver, or waitress may not need to prepare beyond high school plus a brief period of demonstration and practice on the job. The teacher or social worker is required to have a college degree, and many do post graduate work in order to be prepared. Lawyers, physicians, and psychologists must spend about seven years preparing for the roles they must assume in their occupations. Many service jobs require continuous training in new developments and research.

Discuss the relationship between certain high school courses and college entrance requirements. Point out licensing and certification requirements for certain service occupations.

Review some of the more common type knowledges and skills needed in preparation for service occupations.

Reemphasize the need for completing high school and for additional training.

Review minimum educational requirements for certain occupations. Explain the changes taking place in these requirements.

Select three or more occupations in the service category requiring different types of educational preparation, and trace the education and training needed from the beginning of high school until employment. Secure catalogs from each of the public and private junior colleges in the state. Determine which colleges offer programs leading directly to employment in service occupations after successfully completing the prescribed courses (ie, nursing, police science, fireman or, food service).

Secure catalogs from each of the four year colleges and universities in Mississippi. Determine which institutions offer preparation for service occupations (ie, law, social work, psychology, teacher education, guidance, or pre-medicine).

Let each class member investigate the kind of education and training needed for the occupation(s) he has tentativily chosen. Determine the time necessary for preparation and the cost of such preparation.

Point out the other type institutions that offer training for service occupations (e.g. nursing schools, technical institutions).

Get a complete list of course offerings in your school. Learn how English, mathematics, science, and other subjects contribute to the development of skills needed in service occupations. Determine what courses are required of all students and why. Find out what elective courses are offered, and which ones would be beneficial in planning for service occupations.

Find out what courses offered in your school would lead directly to employment after high school. Arrange to discuss with the teachers how these courses would help in preparing for service occupations.

***Students**

UNIT 3
BUSINESS CONTACT CATEGORY

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

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State College, Mississippi 39762

BUSINESS CONTACT CATEGORY

STUDENT OBJECTIVES

1. To be prepared to write a brief definition of the term "business contact", and to list at least five occupations that are included in the business contact category.

2. To study carefully the content of this manual in order to be able to tentatively select one or more occupations for detailed study.

3. To become involved in at least one realistic experience pertaining to each of the occupations tentatively chosen.

4. To be able to list three occupations in the business contact category that you liked the most, and to write at least one reason why you found each interesting.

5. To be able to identify at least three occupations that you like the least, and to write at least one reason why you dislike these occupations.

6. To be able to identify and list your special interests that would help in meeting requirements for success in occupations in the business contact category.

7. To be able to identify and list your special abilities that would help in meeting requirements for success in occupations in the business contact category.

8. To be able to identify personal limitations that may prevent success and satisfaction in the business contact category.

TEACHER OBJECTIVES

1. To spend as much time as necessary to prepare students for the business contact category by reviewing test interpretation and keys to self understanding, and by dealing individually and as a group with problems that may have arisen.

2. To identify what the students know about business contact occupations before beginning the unit by giving a short test.

3. To define the term "business contact" and to characterize it by using illustrations and examples.

4. To acquaint students with business contact occupations by duplicating a printed list with short explanations, and passing these to the students for study and reference.

5. To show the students, on a screen, or by duplicating and passing out printed lists, how occupations can be grouped according to amount of education and skills required, and the degree of responsibility one must assume.

6. To show the students how occupations in the business contact category can be grouped by industries, families, and units of economic activity; to compare these occupations with each other.

7. To involve the students with in-class and out-of-class activities that will help them see the evidence, and importance, of business contact occupations within their community.

8. To lead the students in a brief study of the nature of the work in business contact occupations, where employment is found, education and skills required for entry and advancement (in these occupations), earnings, trends, and employment outlooks.

9. To lead the students in the study of typical personal requirements to be successfully employed in these occupations; to involve students in activities that will aid them in measuring their own personal traits and abilities in relation to these requirements.

10. To provide the opportunity for students to choose one or more occupations in the business contact category and make a detailed study of it through the use of filmstrips, films, occupational briefs, career books, etc.

11. To provide students with realistic experiences that pertain to the business contact category.

12. To provide students with any educational and occupational information needed to intelligently plan a career choice.

REVIEW OF TESTING

Prepare the students for the business contact category by reviewing test interpretation and keys to self-understanding. Restate the meaning of vocational interest, scholastic aptitude, and achievement.

What are psychometric tests?

What is the purpose of psychometric tests?

What do tests tell us about ourselves?

What is the value of tests in (helping to) selecting an occupation?

QUESTIONS RELATING TO THIS CATEGORY

1. What is meant by "Business Contact" relative to the occupations classified herein?

2. What is the importance of this category?

3. How are Business Contact Occupations classified?

4. What is the nature of the work?

5. Where is employment found in Business Contact occupation?

6. What are the educational requirements for entry and advancement?

7. What are the earnings and fringe benefits?

8. What are the typical personal requirements of those successfully employed?

9. How can students explore the occupations in the business contact category?

10. What educational information is necessary for planning a career in business contact?

Prepare a pre-test questionnaire to pass out to the students before beginning the unit. See sample questionnaire in Appendix A. This will enable you to determine what the students already know about business contact occupations. (before beginning the unit) It will be helpful in evaluating the students when they have completed the unit. (See Appendix C for sample evaluation questionnaire)

WHAT IS MEANT BY "BUSINESS CONTACT" RELATIVE TO THE OCCUPATIONS CLASSIFIED IN THIS CATEGORY?

There are occupations in which the principle activity is to persuade or influence other people to sell or buy commodities, investments, real estate, or services. These activities require face-to-face contact, in a business manner, with people. Such occupations have been classified in the business contact category. This category also includes such occupations as demonstrators and insurance agents. Occupations in which selling or buying is routine and personal persuasion relatively unimportant are included in another category.

Arrange for two or more students to do a skit in which one is trying to persuade the others to buy an automobile or an electric range. When the skit has been completed, have a discussion of how such activity is very much a part of business contact occupations.

HOW ARE BUSINESS CONTACT OCCUPATIONS CLASSIFIED?

Review Roe's classification and description of the six groups of occupations. Point out that they are classified according to education and degree of responsibility. Give the students a reference list of the business contact occupations with a brief description of each. The brief description is for student use and will eliminate complete lack of knowledge of certain occupations.

GROUP I

Note: There may be people occupying positions in this group, but they are not presently recognized.

GROUP II

A. Buyer – purchases goods to be resold later for a profit.
B. Manufacturer's Salesman – visits prospective customers to promote and sell a product or line of products.
C. Public relations worker – plans activities and publicity to promote favorable opinions of a product or business.
D. Traffic agent – Sells travel tickets, gives information, and contacts potential customers to promote greater use of the travel service.
E. Travel agent – Plan, arrange, and sell travel accomodations.

GROUP III

A. Buyer
B. Insurance agent – contacts prospective customers, assists in planning adequate protection for a customer's family, and sells policies or contracts which protect individuals and businesses against future losses and financial pressures.
C. Salesman, auto – Sells new and/or used cars and trucks; contacts prospects, appraises trade–in value of old car, and arranges for financing and delivery of new car.
D. Salesman, securities – Buys or sells stocks, bonds, or shares in mutual funds; deals with individuals and large organizations and provides many kinds or related services in order to meet the customer's investment objective.
E. Travel agent
F. Salesman, real estate – represents property owners who want to sell and finds potential buyers for residential and commercial properties. May also rent and manage properties, make appraisals, and arrange for loans to finance purchases.

GROUP IV

A. Salesman, real estate
B. Salesman, securities
C. Auctioneer
D. Demonstrator – arranges setting and shows how a product is used or prepared in order to gain favorable buying attitudes.

GROUP V

A. Retail sales clerk – creates customer interest in buying the merchandise a store has in stock by answering questions about the article, demonstrates its use, how it is cared for, etc., and otherwise helps the customer make a selection.

B. Routeman – drives panel or light trucks over assigned route, sells and delivers goods, or provides services; uses selling ability to increase sales to existing customers and obtaining new business.

C. Salesman, door-to-door – Calls on prospective customers in their homes to show products, demonstrate use or preparation of products, and arrange for sale, delivery, and service of items.

GROUP VI

A. Retail sales clerk

Identify occupations that require varying degrees of persuasive skill when dealing with people on a face-to-face basis. Be specific about the skills required in the occupations.

Identify occupations in the business contact category that require special skills in addition to those that are persuasive.

Occupations can be classified within the organization or unit of economic activity in which they exist. Such classification will help show relationship to other occupations and possible entrance and advancement opportunities. The relationship of business contact occupations becomes somewhat more meaningful when classified in this manner. As can be seen, some business contact occupations cannot be grouped with other occupations. Occupations in the Business Contact category can be classified by families as follows:

1. Retail and wholesale trade
    a. Buyer
    b. Manufacturers' salesman
    c. Demonstrator
    d. Salesman, wholesale
    e. Salesman, auto
    f. Salesman, door-to-door
    g. Routeman
    h. Retail sales clerk
2. Insurance, real estate, and securities
    a. Insurance agent
    b. Salesman, securities
    c. Salesman, real estate
3. Travel agent
4. Traffic agent
5. Public relations worker

Have students list things that they have been persuaded to buy. Have them identify the occupation engaged in by the person who sold the item, and the techniques used in persuading them to buy it. Determine if any of the students have had experience in selling. Have them tell of these experiences.

Select and show to the class a film that portrays duties and pertinent information about business contact occupations. Whenever possible, show a film that is representative of several business contact occupations. Some films to select from are listed in the bibliography of this unit.

Arrange for six students to participate in a panel discussion of the importance of business contact occupations in the community, the state, and the nation. Allow time for the panel to do some research.

Arrange for a resource person who is representative of several business contact occupations to speak to the class. For example, a wholesale salesman, or a store manager may have experience in several business contact occupations, or be in close contact with those who are employed in other occupations.

Involve the students in developing a study display of the business contact occupations. Cut out and mount pictures, charts, and graphs from magazines, newspapers, catalogs, and pamphlets. Develop captions showing the relationship of these occupations to each other and their importance to the community, state, and society as a whole. Acquire other printed information about these occupations.

Arrange for the distributive education coordinator or the business education teacher to speak to the class about selling and business experience. Have the speaker explain the high school programs he represents, and the courses he teaches, and how these may prepare students for business contact occupations.

Have a student list on the chalkboard as the class names the local businesses and firms that employ people in business contact occupations. Ask the class if they know people employed at these places.

Have students collect information from want ads in the newspapers about business contact job opportunities, beginning salaries, working conditions, and other pertinent information. Display this information on the bulletin board.

WHAT IS THE IMPORTANCE OF OCCUPATIONS IN THE BUSINESS CONTACT CATEGORY?

Workers in business contact occupations play an important part in the movement of goods and services. They help maintain full employment in industry and contribute to the high level of business activity in our economic system. Distribution is the middle stage of a three stage economy which starts with the production of the goods and services, and ends with the distribution to the consumer. The average salesman may sell items which support the work of as many as 20 to 30 workers. These workers support families with an average of four members. Thus, the salesman is indirectly providing support for many people.*

"Nothing happens until something is sold". Compare the producer, distributor, and consumer to the center, quarterback, and receiver on a football team. The receiver cannot get the ball from the center

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*Hopke, William E. The Encyclopedia of Careers and Vocational Guidance. pp. 383-384.

without the aid of the quarterback; similarly, the consumer cannot receive goods from the producer without the aid of the distributor. In both cases the middleman plays a vital role. Those in the business contact area are concerned primarily with the distribution of goods and services.

WHAT IS THE NATURE OF THE WORK IN BUSINESS CONTACT OCCUPATIONS?

Most of the occupations in the business contact category are in sales work. Workers in business contact occupations may be involved in selling one item to the consumer, or represent a company that assembles and distributes hundreds–sometimes thousands–of similar products. The job may require that the worker sell directly to the public from a local business, or the job may require extensive travel to reach the people who will buy the goods or services. The worker may spend most of his time waiting on customers, or he may spend considerable time planning and trying to persuade a person or group to buy the goods or services he represents.

The customers include housewives buying groceries and other household goods, people buying sporting goods, and manufacturers and other businessmen buying such items as machine tools, office furniture, or stationery.

WHERE IS EMPLOYMENT FOUND IN THE BUSINESS CONTACT OCCUPATIONS?

Workers in business contact occupations may sell for manufacturers who produce and distribute goods to a broad area of the country; for wholesalers who stock large quantities of goods so that smaller lots may be purchased and resold for a profit by retail stores, door-to-door salesman, and routemen; for hardware stores, automobile dealers, furniture and appliance stores, and other retail dealers who deal with the wants and needs of the public. Employment may be found at local businesses or with firms outside the community which need workers to cover the local territory.

WHAT ARE THE EDUCATIONAL REQUIREMENTS FOR ENTRY AND ADVANCEMENT IN BUSINESS CONTACT OCCUPATIONS?

Such general education courses as English and communications, speech, business mathematics, general business, and economics are vital to a person planning to go into occupations in the business contact area. Experience, as well as education, is vital for advancement to the upper groups of occupations in the business contact occupations. Part-time work while in high school would be valuable to students planning to enter business contact occupations immediately after graduation. Experience and specialized training may be gained by participating in a cooperative education program while in high school.

Most employers require beginning workers in business contact occupations to have at least a high school diploma. Occupations such as the retail sales clerk require some on-the-job orientation and experience, after which a person may become quite adept at fulfilling the required responsibilities. The work of manufacturer's salesmen and buyers dealing with complex products is much different. These may require years of specialized training in engineering or some other field. Other business contact workers dealing in specialized services and products may acquire technical knowledge by taking courses offered at universities or by the manufacturers. Still others gain knowledge through years of on-the-job experience, often supplemented by home study. Thus, a buyer may better qualify for his job by attending a college or university; a real estate salesman may take university extension courses; a demonstrator may participate in industry-sponsored training programs before beginning his duties.

WHAT ARE THE EARNINGS AND FRINGE BENEFITS IN BUSINESS CONTACT OCCUPATIONS?

Many salesmen are paid on a commission basis. The amount they earn will depend upon individual initiative and drive. Salaries for most sales occupations range from $5,000 to $10,000 a year. Highly successful real estate agents, securities salesmen, and insurance agents may earn as much as $25,000 a year. Beginning salaries for traffic agents may range from $4,500 to $5,500 with experienced workers earning as much as $6,200. Beginning public relations workers average about $5,800 a year. Those employed by large organizations may earn as much as $27,000 a year.

Retail sales clerks may be paid by the hour. The beginning wages are about $1.75 an hour. Pay scales by union contracts are $2.00 or more an hour. Retail sales clerks, as well as other sales workers, may be permitted to buy products at a discount at the store where they work.

Almost 4.8 million workers were employed in sales occupations in 1966. About one-fourth were part-time employees who usually worked fewer than 35 hours a week. Two out of every five were women, employed mainly in retail stores. About three-fifths of the total number in sales occupations were employed in retail trade. Wholesale salesmen and manufacturers' salesmen made up the next largest groups of sales workers. It should be noted here that many of the jobs in which personal persuasion is routine and the person-to-person relationship is relatively unimportant are included in these figures. However, such jobs have not been included in the business contact category. There are indications of opportunities for employment in any of the occupations in the business contact category. During the 1970's employment, particularly in the sales occupations, is expected to rise moderately. There will be more people demanding more goods and services. This means there will be more goods and services produced, and people will be needed to move these to the public.

WHAT ARE THE TYPICAL PERSONAL REQUIREMENTS OF THOSE SUCCESSFULLY EMPLOYED IN THESE OCCUPATIONS?

Every occupation is different in regard to personal requirements and training necessary for entry and advancement. People who do not possess all the personal requirements for a given occupation may still be quite successful. But, there are certain traits that are recognized as being beneficial to success and satisfaction in an occupation or several occupations. The following would be beneficial for one planning to enter one or more of the occupations in the business contact category:

1. Ability to work independently and make own decisions
2. Facility with language (written and oral)
3. Outgoing personality
4. Desire to deal with people
5. Ability to cope with frustrations and problems in dealing with people
6. Ability to relate to and deal with people at all levels and to recognize and cope with many different personalities
7. Ability to exercise persistence in persuasive-type activities
8. Ability to calculate rates, interests, dividends, etc.
9. Knowledge of credit, marketing and economic conditions, sales, psychology, and advertising
10. Ability to plan activities, and to keep records of sales, credit and payment, and billing

Devise a check list from the list of personal characteristics to pass to the students for evaluating themselves against these characteristics.

See Appendix D for a sample supplementary check list to be used at this point.

Qualification for business contact work depends primarily upon the ability to relate effectively to other people, but clerical ability is also needed for some of the tasks. The more demanding business contact jobs require the social insight to evaluate human personalities and gauge their reactions. However, business contact workers are not required to have a professional understanding of the individual in the sense of the lawyer, clergyman, counselor, or social worker. More difficult business contact jobs require the exercise of judgement and reasoning in carrying out rules and regulations, and the type of outgoing personality which generates easy communication with others.

In most selling situations, there is required a capacity for energetic promotion, skill in persuasion and determination to convince in the face of resistance or indifference.*

Discuss why such personal characteristics are essential for success and enjoyment in doing business contact work. Relate points throughout to specific occupations.

Discuss special skills required to certain business contact workers. An example would be the required technical knowledge of equipment the IBM salesman must possess.

Men have traditionally occupied most roles in these occupations, rather than women, particularly at the upper levels. However, there are examples of women being quite successful in these occupations at all levels. There are many women in such occupations as retail sales clerks and door-to-door selling. This may be true because of the relatively small amount of preparation needed for entry into such occupations. Many do this on a part-time basis.

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*Counselors Desk Aid. U. S. Department of Labor.

HOW CAN THE STUDENTS EXPLORE THE OCCUPATIONS IN THE BUSINESS CONTACT CATEGORY?

Presentation of the content suggested thus far, and student involvement in the activities conducted during the presentation, should have prepared the student for tentatively selecting one or more occupations to explore in the business contact category. Review the section in the teacher's handbook that explains how individual exploration of occupations should proceed.

Providing the students with specific occupational information is the beginning of several phases of individual exploration that will carry the student through realistic and meaningful experiences related to the occupations in question. All materials needed should be readily available. The student should fully understand how to use the materials.

The instructor should review the teacher's handbook for information on how the students may get maximum benefit from exploration of printed material, use of filmstrips and tapes, suggested resources, etc.

See Appendix B for a suggested occupational study form for use when exploring an occupation.

Devise a check sheet or a progress chart for use in keeping a record of what the students are doing during the individual exploration periods. Students would simply check with the teacher each time they change direction and begin exploring a different business contact occupation. This may also be used for keeping records of all activities the students are involved in during this and other units.

Let the students make brief oral reports to the class on one of the occupations explored. Allow enough time for them to do research on the occupations they have selected.

The second phase of individual exploration is to provide the students with directions for doing one or more activities pertaining to the occupations they have chosen to explore in depth, and to provide for a place to conduct such activities. The tools and materials needed for the activities must be available. Students will be able to help in this respect.

Review the teacher's handbook for information on the purpose of mock or simulated activities, instructor and student roles during these activities, and other related learning experiences that will apply to occupations in this category. See the simulated activity in appendix F.

EVALUATION

WHAT EVALUATION SHOULD BE MADE FOR THE UNIT AS A WHOLE?

Some student and teacher evaluation tools have been suggested during the unit. There should be a culminating evaluation at this point to determine (1) the behavior changes produced by the presentation of the general information to the group and (2) the behavior changes occurring from individual exploration of specific occupations.

Prepare an evaluation questionnaire to give to the students when they have completed this unit. (see Appendix C for a sample.)

WHAT EDUCATIONAL INFORMATION IS NECESSARY FOR PLANNING A CAREER IN BUSINESS CONTACT WORK?

The students have had the opportunity to evaluate their fitness for occupations in the business contact category. But, all these occupations require preparation of some sort before the prospective worker is fully qualified to carry out the duties involved. This preparation includes both general education and specialized training. The amounts will vary with each group in which these occupations have been classified. The retail sales clerk may not need to prepare beyond the minimum formal education plus a brief period of demonstration and practice on the job in order to carry out necessary responsibilities. The buyer or public relations worker, on the other hand, will probably need a college degree. He may also have several years of experience in other related fields of employment. The manufacturer's salesman will probably be a college graduate. His job will require continuous education in order to stay abreast of consumer trends and new product information, and to deal with competition.

Most occupational briefs and other printed materials will indicate educational preparation necessary for pursuit of this occupation as a career. Many schools or areas do not offer such educational courses or curriculums. The teacher-counselor must lead the students in discovering educational offerings in the local school and possible alternatives in planning a curriculum for business contact occupations.

Such general education courses as English, communications, business mathematics, economics, salesmanship, public speaking, finance, psychology, and business law are vital for entering most of the occupations in the business contact category. The high school cooperative program in distributive education would provide for study in several of these areas, as well as on-the-job experience under the direction and supervision of an employer. This program will provide an avenue of entrance in several of the business contact occupations during the junior or senior year in high school. This prepares the student for full-time employment immediately after graduating from high school. He may then advance to a higher position with experience and desire. During participation in the program, his school day is divided between the regular school activities and on-the-job training. If the school has such a program, students may arrange for a conference with the teacher-coordinator to get further information.

Students may be able to get the desired courses not offered in the high school at one of the public junior colleges. Several junior colleges offer training in marketing and distribution technology. This training program is primarily for those interested in mid-management occupations. Therefore, it is somewhat more advanced than the high school cooperative program.

More specific information on the junior college offerings can be obtained by writing directly to the admissions office and/or the information director. A vocational-technical guide of Mississippi junior college offerings can be obtained from the Vocational and Technical Division, State Department of Education, Jackson.

Information concerning private and out-of-state junior colleges can be obtained by writing directly to the institutions.

Several Mississippi state-supported four-year colleges and universities offer programs of study in liberal arts, business, marketing, management, and economics. Such fields may very well qualify people for entry in responsible positions in certain business contact occupations. Those interested should write to the departments at the colleges or universities, and ask for such information as required courses and electives, typical occupations the graduates enter, and high school courses needed to enroll in a particular field of study.

Some amount of on-the-job training is essential even for the college graduate who initially enters an occupation. All occupations are unique in respect to certain educational and skill requirements. This may be such that it can be learned only in the particular work setting. Employers have various means of giving on-the-job orientation and training to new workers.

The employee anticipating entering a career as a buyer will start as a buyer trainee and work for quite some time as an assistant buyer. Some manufacturers have on-the-job training programs for their salesmen who have college degrees in business or engineering. This may last for a year or longer. Brokerage offices, investment bankers, and mutual fund firms provide training for beginning security salesman that last six months longer. Large travel agencies may give about six months of on-the-job training. Before they begin selling, new insurance agents usually receive training at insurance company home offices or at the agencies and brokerage firms where they will be working. Newly hired sales clerks may receive on-the-job instruction under the close supervision of an experienced employee. In larger stores training programs may be more formal, and beginners usually attend training sessions for a few days.

For additional information about entry in and preparation for specific occupations in the business contact category, contact local business establishments. They may know about the availability of training programs, job opportunities for part-time or full-time work, or scholarship and/or loans.

UNIT 4
ORGANIZATION CATEGORY

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
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MISSISSIPPI STATE UNIVERSITY
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Sponsored by the
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ORGANIZATION CATEGORY

TEACHER OBJECTIVES

1. To help students conceive the concept "organization" so they may better understand the relationship of occupations in this category.
2. To characterize and define briefly what is meant by "organization occupations."
3. To introduce students to the organization occupations by defining each occupation, by giving students a list and definition of the occupations, and by using slides of persons employed in these occupations.
4. To help students realize the importance of the role played by those engaged in organization occupations.
5. To give students a brief characterization of the nature of the work in organization occupations.
6. To relate to students the type of environment and location where organization occupations may be found.
7. To discuss briefly, in groups, the general educational requirements for entry and advancement in these occupations.
8. To inform students of the typical earnings and fringe benefits that can be expected by those employed in organization occupations.
9. To give students an insight into the employment trends and outlook for occupations in this category.
10. To motivate students to strive for higher achievements in their school work by showing them the relationship between subjects taken in school and occupations in the organization category.

STUDENT OBJECTIVES

1. To understand the relationship of occupations in the organization category.
2. To know what is meant by the concept "organization occupations."
3. To list and define typical occupations found in this category.
4. To realize the importance of the role played by those engaged in organization occupations
5. To characterize the nature of the work involved in these occupations.
6. To know the type of environment and location where organization occupations may be found.
7. To discuss briefly, in groups, the general educational requirements for entry and advancement in these occupations.
8. To know the typical earnings and fringe benefits that can be expected by those employed in organization occupations.
9. To gain an insight into the employment trends and outlook for occupations in this category.
10. To strive for higher achievements in school work after being shown the relationship between subjects taken in school and occupations in the organization category.
11. To increase knowledge of self in relation to occupations.
12. To acquire information about and understanding of a specific occupation through reading occupational information and by engaging in occupation related activities.

13. To know what sources are available for in-depth study of specific occupations.
14. To become familiar with several institutions offering training in a specific occupation.

QUESTIONS RELATING TO THIS CATEGORY

1. What is meant by the term "organization"?
2. What are the occupations in the organization category?
3. What is the importance of occupations in the organization category?
4. What is the nature of the work in organization occupations?
5. Where is employment in organization occupations found?
6. What are the educational requirements for entry and advancement in organization occupations?
7. What are the earnings and fringe benefits in organization occupations?
8. What is the employment outlook for occupations in the organization category?
9. What is the relationship between subjects taken in school and occupations in the organization category.

Help students reevaluate their personal characteristics, interests, aptitudes, and achievements that were discussed in the Orientation Section. Place special emphasis on the characteristics, interests, aptitudes, and achievements that are necessary for successful entrance and advancement in organization occupations.

WHAT IS MEANT BY THE TERM "ORGANIZATION"?

Webster defines organization as "the act or process of organizing." To clarify this definition it is necessary to define the term "organize." Organize as defined by Webster means "to put in a state of order; to arrange elements into a whole of interdependent parts; to arrange or constitute into a coherent unity in which each part has a special function or relation." In other words, organize means taking people, things, or data which are working by themselves and combining these in an orderly manner to accomplish a specific purpose.

"These are the managerial and white collar jobs in business, industry, and government, the occupations concerned primarily with the organization and efficient functioning of commercial enterprises and of government activities."[1]

These are typically "desk jobs" which are necessary for the smooth running of business and government activities. Examples are hotel manager, stenographer, typist, and certified public accountant."[2]

Numerous occupations are found in this category, which is the second largest in Dr. Ann Roe's schema – technology is the largest category. Every one of the six groups in the organization category will contain occupations.

Give students a pretest to determine their knowledge of this occupational category. See Appendix A for a sample pretest.

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[1] Ann Roe, The Psychology of Occupations (New York, 1956), p. 182.

[2] Willowbrook High School, A Report On Project CVIS (Villa Park, Illinois, 1969), p. 19.

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WHAT ARE THE OCCUPATIONS IN THE ORGANIZATION CATEGORY?

Encourage students to give examples of people they know who are employed in these occupations. Have them tell what they know about the occupation – the type work, earnings, environment, etc.

Show slides, if possible, of persons employed in these occupations as each is discussed.

GROUP I

Economist – compiles, processes, and interprets economic and statistical data; concerned with the solution of economic problems arising from the production and distribution of goods and services; (study conditions affecting production, distribution, and consumption of goods and services.)

GROUP II

A. Actuary – calculates insurance and annual payments on insurance contracts, money set aside to meet debts, and shares of surplus allocated to a policyholder in a participating insurance company.

B. Certified public accountant – reviews financial records and reports and gives opinions as to their reliability; advises clients on tax matters and other financial and accounting problems; and meets states' legal requirements for public practice.

C. Controller, bank – authorizes and controls the use of funds kept by the treasurer; supervises the maintenance of accounts and records; analyzes these records; and often formulates policies that concern the bank's financial problems.

D. Economist, government industrial – studies and analyzes economic factors involved in production, distribution, and use of goods or services to insure maximum use of assets and to develop desirable markets; interprets effects of government regulations and restrictions on industrial policies.

E. Geographer, economic – analyzes the geographic distribution of economic activities, including manufacturing, mining, farming, trade, and communications.

F. Hospital administrator – supervises and coordinates the administrative activities of the hospital with the medical services; supervises the operation of a hospital and all related units.

G. Bank loan officer – examines applications for loans and analyzes potential loan markets.

H. Manager, advertising – plans the advertising policies of the organization, establishes budgets, and determines what type of advertising methods can be most effectively used.

I. Manager, hotel – has responsibility for operating hotels profitably and providing the best possible services and comfort for guests; is in charge of personnel, the money for operating the hotel, and publicity about the hotel.

J. Marketing researcher – collects, analyzes, and interprets data to determine potential sales of a product or service.

K. Personnel relations administrator – organizes, directs, and coordinates industrial relations activities of an organization, such as assembling and analyzing data concerning problems of absenteeism, labor turnover, and employment of physically handicapped and women; conducts surveys on living costs and wage rates; studies current labor laws and regulations; etc.

L. Production manager, advertising – coordinates activities of design, illustration, photography, paste-up, and typography personnel to prepare advertisements for publication, and supervises workers engaged in pasting-up advertising layouts in art department or studio.

M. Purchasing agent – buys raw materials, machinery, supplies, and services required by businesses or companies, considering cost, quality, quantity, and time needed.

GROUP III

A. Automotive parts counterman – purchases, stores, and issues spare parts for automotive equipment from behind a counter in a repair shop or parts store.

B. Cashier, bank – directs bank's monetary programs, transactions, and security measures in accordance with banking principle and legislation; receives funds from customers and employees; disburses funds; and records monetary transactions incidental to conduct of business.

C. Claims adjuster, insurance – investigates claims for loss or damages filed in conjunction with insurance policy and tries to effect settlement out of court.

D. Employment interviewer – interviews job applicants in an employment agency and refers them to prospective employers for consideration.

E. Housekeeper, hotel – supervises work activities of cleaning personnel to insure clean, orderly, and attractive rooms in hotels.

F. Manager, hotel – (see definition in Group II)

G. Programmer – works in the field of electronic data processing; writes and codes the instructions which control the work of a computer.

H. Secretary, private – schedules appointments, gives information to callers, takes dictation, and otherwise relieves officials of clerical work and minor administrative and business detail.

I. Secretary, social – attends to social, business, and personal affairs of employer.

J. Stenographer, technical – takes dictation in shorthand of correspondence, reports, and other matter, and transcribes dictated material, using a typewriter; takes dictation in medical, legal, or scientific terms.

K. Stenographer, court – records proceedings in law courts; specializes in shorthand reporting, either manual or machine.

L. Teller, (all kinds) – receives and pays out money and keeps records of money and negotiable instruments involved in various transactions.

M. Traffic manager, industrial – arranges for transportation of raw materials and finished products to and from industrial and commercial firms; determines the kind and amount of goods to be shipped, the time when delivery is needed; chooses the type transportation, the route, and finally the particular carrier, or transportation company.

N. Traffic agent, airlines – sells flight tickets, reserves seats and cargo space, and takes care of the ground handling of airplanes. (Traffic representative works to build up the use of air travel to increase business; contacts possible customers and makes calls to businesses and industries to encourage more extensive use of the airlines.)

GROUP IV

A. Accountant – compiles, analyzes, and prepares such business and financial records as profit and loss statements, balance sheets, cost studies, and tax reports.

B. Adding machine operator – uses machines which perform the calculations of addition, subtraction, and sometimes multiplication; transcribes the machine calculations onto business report forms or other type records.

C. Automotive service advisor – confers with the customer to determine his service needs and arranges for a mechanic to do the work; waits on customers who bring their automobiles in for maintenance and repairs.

D. Billing machine operator – prepares statements, bills, and invoices to be sent to customer, itemizing amount customer owes, using billing machines with or without computing devices.

E. Bookkeeper, general – records and summarizes the financial transactions of a business, industry, or institutional agency.

F. Bookkeeping machine operator – operates simple bookkeeping machines which record only one type of transaction, such as accounts payable, or, in banking operations, only deposits; sorts documents to be posted; prepares periodic trial balances.

G. Calculating machine operator – uses mechanical or electrically operated computers to obtain various kinds of calculations, such as division, multiplication, addition, subtraction, square root, and statistical computations.

H. Card – tape – converter operator – operates machines which automatically transcribe data from punch cards to reels of tape or from tape to punched cards, for use in automatic data-processing equipment; wires a fairly simple plugboard and interprets signals from a panel of lights on the machine.

I. Clerk, billing – receives the payments made by customers for goods and services; prepares invoices and bills of lading.

J. Clerk, disbursement – verifies accuracy of loan applications and prepares a file for each loan transaction.

K. Clerk supervisor, shipping – supervises and coordinates activities of workers engaged in packing and shipping merchandise or material and keeps records of shipments.

L. Clerk, bank reconcilement – reconciles total shown on company's bank ledger with total shown on company's bank statement by listing outstanding checks, deposits not yet posted by the bank, and service charges not yet posted on company records, and computing adjusted totals using an adding machine.

M. Clerk, bank trust investment – posts the daily investment transactions of bank customers.

N. Clerk, bank country collection – sorts the thousands of pieces of mail which come in daily to a city bank and determines which items must be held at the main office and which should be routed to branch banks or out-of-city banks for collection.

O. Clerk, bank transit – sorts bank items such as checks and drafts on other banks, lists and totals the amounts involved, and prepares the documents so that they can be mailed for collection.

P. Clerk, bank exchange – services foreign deposit accounts and determines charges for cashing or handling checks drawn against such accounts.

Q. Clerk, bank interest – maintains records relating to interest-bearing items which are due to or from the bank; collects interest on these contracts.

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R. Clerk, bank mortgage – types legal papers affecting title to real estate upon which money has been loaned, and maintains records relating to taxes and insurance on such properties.
S. Console operator – checks and controls electronic digital computer to process business, scientific, engineering, or other data according to operating instructions; operates the computer; examines the programmer's instruction sheet for the run and ascertains the procedure to be followed.
T. Conductor, railroad passenger – supervises and coordinates activities of a train crew engaged in transporting passengers on passenger trains.
U. Front office clerk, hotel – accommodates hotel patrons by performing any combination of the following duties: registering and assigning rooms to guests; issuing room key and escort instructions to bellman; date-stamping, sorting and racking incoming mail and messages; transmitting and receiving messages, etc.
V. High-speed printer operator – operates high-speed printing machine to convert scientific, engineering, or business information previously recorded on reels of tape into printed records.
W. Proof machine operator, bank – sorts, records, and proves records of bank transactions, such as checks, deposit slips, and withdrawal slips, using proof machine.
X. Receptionist – receives clients or customers coming into an establishment, discovers their wants, and directs them accordingly.
Y. Salesperson, retail – displays, describes, and sells to individuals, merchandise such as hardware, furniture, and garments; utilizes general knowledge of the characteristics, quality, and merit of items sold.
Z. Station agent, railroad – supervises and coordinates activities of workers engaged in selling tickets, checking baggage, and maintaining building and grounds of railroad station.
AA. Stenographer, general – takes fairly routine dictation and performs routine office tasks; transcribes dictated material, using typewriter.
BB. Tape librarian – classifies catalogs, stores tapes, and makes them available when they are needed again.

GROUP V

A. Cashier, box office – sells tickets for admission to places of entertainment, such as skating rinks, baseball parks, stadiums, and amusement parks.
B. Cashier, checkout – itemizes and totals customer's purchases in self-service grocery or department store, using cash register; collects money from customer and makes change; may stock shelves, weigh items, bag merchandise, and issue trading stamps.
C. Clerk typist – performs general clerical work requiring use of typewriter in majority of duties; combines typing with filing, sorting mail, answering the telephone, and other general office work.
D. Clerk, mortgage – types the legal papers necessary for real estate titles, records the transactions, and maintains record card files.
E. Clerk, waybill – types shipping tickets and other specialized forms in a railroad office and performs other type general office work.
F. Clerk, accounting – performs variety of routine calculating, posting, and typing duties to accomplish accounting; that is, posts details of business transactions, totals accounts, types vouchers, etc.

G. Clerk, shipping – checks to see that an order has been filled correctly before it is shipped, prepares bills of lading and any other shipping forms needed, makes records of the weight and cost of each shipment, checks each shipment for correct address, and keeps accurate records on each shipment.

H. Clerk, insurance policy change – compiles data on changes in insurance policies and enters changes in beneficiaries and coverage on policies, in accordance with the instructions given by agents.

I. Duplicating machine operator – reproduces handwritten or typewritten matter, using a duplicating machine; may keep a record of the number of copies made.

J. Embossing machine operator – operates machine to emboss names and addresses on metallic and nonmetallic plates for use in duplicating or addressing machines or for use in name plates and tags.

K. Insurance checker – checks the information entered on policies by other clerical workers to be certain that the work is accurate.

L. Key punch operator – uses machines similar in action to typewriters to punch holes in a card in such a position that each hole can be identified as representing a specific item of information.

M. Mail machine operator, preparing – runs automatic equipment which handles outgoing mail; feeds the mail into envelope-opening machines that will fold mail enclosures and insert them in envelopes, or seal, stamp, or address mail.

N. Mail carrier – sorts mail for delivery and delivers and collects mail on assigned routes.

O. PBX operator – works at switch boards in business establishments and may operate a cord or cordless switch board; assists people in placing calls and helps locate desired parties; keeps record of calls completed, charges incurred, and the department to be charged.

P. Policy writer, insurance – types onto policy forms, from approved insurance applications, the name and address of the policyholder, amount of the policy, premium rate, and other information.

Q. Postal clerk – sorts incoming and outgoing mail in a post office and serves the public at the windows in post office lobbies, selling stamps and money orders and providing other services.

R. Sorter, bank – separates bank documents, checks, deposit slips, and other bank items into different groups and tabulates each "batch" so they may be charged to the proper account.

S. Tabulating machine operator – operates a machine that processes information from tabulating cards into printed records; routes processed cards to the next work station.

T. Tape perforator operator – types letters, reports, and other material from master copy to perforated tape using a special typewriter; pastes gummed paper over holes to correct errors; may file perforated rolls; may operate automatic typewriter that reproduces material from perforated tape or paper.

U. Telephone operator – aids persons using telephone services, as well as other telephone operators, placing calls and making telephone connections.

V. Telegrapher, railroad – transmits and receives messages, train orders, and car reports in Morse code, using manual or semiautomatic key.

W. Ticket agent, railroad – collects fares from passengers in a train station as they pass through the waiting room to the platform.

X. Transcribing machine operator – transcribes letters, reports, or other recorded data, using a transcribing (voice reproducing) machine and a typewriter.

Y. Typist, data – converts alphabetic, numeric, and symbolic data into coded form on punched cards or tapes.

GROUP VI

A. Mail machine operator, handling – tends machine that automatically seals envelopes and imprints postmark on envelopes or tape to be posted on packages.

B. Sorting machine operator – tends machine that automatically sorts perforated tabulating cards into specified groups.

It should be pointed out that the President of the United States, Cabinet members, governors of the fifty states, and other high government officials are considered to be a part of the organization occupation category. Industrial tycoons, top executives of all sizable organizations, international bankers and merchants, and top level labor leaders should also be mentioned at this point. Divide the class into sections and have each section make a report on one of the occupations mentioned above giving the duties of the office or the job, how one is chosen to fill the position and other pertinent information.

Select a film to show to the class that portrays duties and pertinent information about organization occupations. Whenever possible, show a film that is representative of several occupations in this category. A list of suggested films are found in the appendix.

Arrange for four to six students to participate in a panel discussion of the importance of organization occupations in the community, state, and nation. Allow time for the students to prepare for the discussion.

Have a resource person who is representative of several organization occupations speak to the class. For example, an officer of a bank who is familiar with several organization occupations found in his establishment.

Ask the business education teacher to speak to the class on office occupations to include the following: secretarial occupations, business machine operator occupations, and occupations in data processing. Have him explain the program he represents, the courses taught, and how these courses help prepare students for organization occupations.

WHAT IS THE IMPORTANCE OF OCCUPATIONS IN THE ORGANIZATION CATEGORY?

No one group of occupations can be said to be more important than another group. Every worker in any business or government organization has a job that must be done. Some of the workers in any establishment actually do the work: in a store the sales people do the selling; in a school the teachers do the teaching. Other people in any establishment must see that the work gets done. The salesman in the store could not sell if someone didn't see that he had products to sell and a place to sell them. Teachers couldn't teach if the superintendent hadn't organized the school, seen that classrooms were built, provided supplies, etc.

This last group, the ones who organize other people and things to get a job done, are the ones we are discussing in this unit. Although they do not actually do the work of a business or organization, very little would get done without them.

Select a business with which the students are familiar and lead the group in making a list of the "organizing" jobs that must be done by the owner or manager.

WHAT IS THE NATURE OF THE WORK IN ORGANIZATION OCCUPATIONS?

Most of the occupations in this category can be called "desk jobs," and the work can be characterized as "paper work." An accountant works largely with the financial records of an organization. A secretary may do many types of jobs for her employer, but in each case the work is done largely behind a desk and involves written materials – paper work.

A few of the occupations in this category require a lot of contact with people. Some require some movement both inside and outdoors. Primarily, however, these occupations require a person to stay behind a desk and work with written materials, and various types of machines such as, adding machines, calculators, data processing equipment, etc.

Have each student interview some person employed in an organization occupation from their list and write a short description of that person's work.

WHERE IS EMPLOYMENT IN ORGANIZATION OCCUPATIONS FOUND?

An organization of any size must have people whose job is to organize and direct the work of others. Therefore, any business or government organization involving more than a few employees has people engaged in organization occupations.

Any organization employing more than just a few people must have someone who is responsible for organizing and directing the work of others. Most businesses, industries, schools, and city and county government would have occupations in this category.

Obtain listings of occupations found in a least two local businesses and one government office. Have the class, as a group, determine which occupations are in the organization category and their percentage of the total.

Have each student attempt to make a list of types of businesses in which there are no organization occupations.

WHAT ARE THE EDUCATIONAL REQUIREMENTS FOR ENTRY AND ADVANCEMENT IN ORGANIZATION OCCUPATIONS?

As was discussed in the introductory section, the general educational requirements for entrance into an occupation in Group I is a minimum of a bachelor's degree, usually in a particular subject area.

Economists, who are found in this group, must have a thorough grounding in economic theory, economic history, and methods of economic analysis. For those who want to advance to positions that require more research and more responsibility, graduate work should be planned.

A bachelor's degree in a particular subject area is usually required for entry into the occupations in Group II. Some of the occupations, such as an actuary and a certified public accountant, require special examinations. An actuary must pass a series of examinations, which usually take approximately five to ten years to complete, to gain full professional status. Accountants must pass the CPA examination provided by the American Institute of Certified Public Accountants and be licensed or registered by the state board of accountancy in their particular state before they can practice as a "certified public accountant." Often special training may be needed to enter and/or advance in some of these occupations. For example, one wishing to be a bank controller may be required to participate in a well-organized officer-training program which may be from six months to one year in length.

Group III requires a high school education for entrance. Some employers of persons in such occupations as employment interviewer and programmer prefer employees who have a college degree. Additional training in some occupations, (programmer, accountant, etc.,) is important for advancing to levels of greater responsibility.

In Group IV a high school education is required. It is preferable for an interest clerk in a bank to have more education, but this is not a restrictive factor.

As was mentioned in the introduction, certain high school courses relating to the specific occupations are important in entering Group V. Typewriting would be a "must" for one wishing to be a typist or a clerk typist. Business machines would contribute to success as a duplicating machine operator, transcribing machine operator and a tabulating machine operator. A checkout cashier and some other occupations in this group require involvement in special training classes. A high school education is required for entrance in this group.

Group VI occupations do not require a high school education, but those who have this education may be preferred over those who do not. On-the-job training would possibly be the only training a mail machine operator and a sorting machine operator would need.

Have students choose a particular occupation from the list given in preceding pages and write a paragraph on the educational requirements for entering and advancing in the occupation. Allow the students time to do some research to gather the information they need. This may be used as a homework assignment. Give the students examples of sources where this information can be found.

WHAT ARE THE EARNINGS AND FRINGE BENEFITS IN ORGANIZATION OCCUPATIONS?

Earnings vary greatly from occupation to occupation in this category. In these occupations, as well as occupations found in the other categories, earnings may depend upon the type of education one has, the size and type of the place of employment, special training programs and special examinations taken, degree of responsibility one must assume and numerous other factors.

An economist, a Group I occupation, has a beginning salary of approximately $5,300. As he acquires more experience and more responsibility his earnings may increase to $17,000 or more.

Earnings in Group II occupations range from $5,500 as a beginning salary to $50,000 or more as a maximum. Purchasing agents, for example, earn from $5,500 to $50,000 based upon the factors given above. A market researcher may earn from $6,900 to $16,000 or more; an advertising manager from $8,000 to $30,000 or more; an actuary from $6,500 to $25,000 or more; a CPA from $8,150 to $50,000 or more, etc.

Group III earnings range from about $3,200 to $50,000 or more. To be more specific, a hotel manager may earn from $4,000 to $50,000 or more, an accountant from $7,000 to $18,000 plus, and a hotel housekeeper from $3,200 to $15,000 or more. Again, the size and type of the place of employment, among other things, are determinants of the earnings of a particular occupation.

In Group IV, a railroad passenger conductor may earn approximately $11,400 a year; a bank transit clerk usually earns from $2,500 to $3,000, depending on certain factors; a general bookkeeper may earn $3,500 to $4,500 or more; a secretary may earn $5,000 plus, though normally less.

Occupational earnings in Group V range from about $2,500 to $7,200. Telephone operators usually earn from $3,300 to $6,200, typist from $3,400 to $5,000, PBX operators from $2,500 to $4,150 and railroad ticket agents from $5,600 to $7,200.

Both occupations in the last group have comparable earnings from $3,750 to $5,850.

Be sure to keep in mind when choosing an occupation that many factors determine the earnings, not necessarily the occupation itself.

Fringe benefits for all of these occupations are very similar. These are: vacations with pay, some paid holidays, group life insurance, hospitalization and surgical benefits, and retirement plans. Some have fringe benefits that are peculiar only to their occupation. Banking occupations offer profit sharing or bonus plans and preferred banking services, and hotel housekeepers are provided with laundry and free uniforms. Fringe benefits in any given occupation may vary considerably from one business to the next.

Provide students with several copies of some of the larger state-wide newspapers and have the students check the want-ad section to see what typical salaries are listed for organization occupations. Have students report their findings to the class.

WHAT IS THE EMPLOYMENT OUTLOOK FOR OCCUPATIONS IN THE ORGANIZATION CATEGORY?

Organization occupations are found in almost all types of businesses and government offices, and includes many types of occupations. There is no statement of employment opportunity that will apply to all occupations in the category; however, some generalizations can be made.

Our expanding economy and a continued high level of business activity will create an excellent demand for people properly trained in Group I and II organization occupations.

The demand is expected to be very good in most of the occupations found in Groups III and IV. Increased automation, low job turnover rates, and decreasing passenger traffic will make railroad occupations the exceptions.

The outlook in occupations in Groups V and VI is good to moderately good. Some jobs in these groups will be replaced by automation. Many of these jobs are held by women, however, and their turnover rate is large enough to keep the outlook good.

Ask an employer who has several office workers to speak to the class. Ask him to emphasize the shortage of trained workers and opportunities for advancement.

WHAT IS THE RELATIONSHIP BETWEEN SUBJECTS TAKEN IN SCHOOL AND OCCUPATIONS IN THE ORGANIZATION CATEGORY?

Most of the occupations in Groups I and II of this category require at least a college degree. A student interested in one of these occupations should, in high school, follow a general college preparatory curriculum. If the school offers courses that apply directly to the occupation chosen, special emphasis should be given to these courses. For example, a student interested in becoming an economist would certainly place special emphasis on high school economics if it is offered.

The occupations in Groups III and IV require at least a high school diploma. Employers prefer some college in some of the occupations. Many of the occupations require some kind of specialized training after high school. Students interested in one of these occupations should take high school subjects that would prepare them for the occupation or for further training. Many of these occupations are office occupations. High school subjects such as typing, shorthand, or bookkeeping will be valuable on the job, or in post-high-school training.

Some occupations in Group V and VI do not require a high school diploma, but most employers will hire only high school graduates. A student interested in any one of these occupations should take any subjects offered that will help to prepare him for employment. For example, if a student is interested in a retail selling job he should take Distributive Education if it is offered.

List, with the students' help, all courses offered by your school that might apply directly to organization occupations.

Have each student choose an occupation that he might be interested in from this category and plan a high school curriculum based on this choice. Have each one distinguish between courses that relate directly to the occupation or to further training in the occupation and general education courses. Emphasize that the students are not actually making a vocational choice and planning a curriculum, but are learning to do so.

End this introduction section to the organization category by briefly summarizing the material that has been covered to this point.

Each student will now choose an occupation from those listed under the third question for further study. When choosing an occupation to explore, the student should be reminded that he is to compare his personal characteristics, interests, aptitudes, and achievements with those that are required for successful entrance and advancement in the particular occupation. Review the section in the Teacher's Handbook that explains how individual exploration of occupations should proceed.

Provide the students with specific occupational information such as pamphlets and booklets, filmstrips, etc. (see appendix for a list of suggested materials) and with general occupational information materials such as the Occupational Outlook Handbook, Dictionary of Occupational Titles, Encyclopedia of Careers, *etc. This is the beginning of several phases of individual exploration that will carry the student through realistic and meaningful experiences related to the occupation in question. All materials needed should be readily available. Make sure that each student understands completely how to use the materials.*

Review the Teacher's Handbook for information on how the students may get maximum benefit from exploration of printed material, use of filmstrips and tapes, suggested resources, etc.

Have each student complete an occupational study form as he explores an occupation. See Appendix B for a suggested occupational study form to be utilized.

A check sheet or progress chart should be devised for use in keeping a record on each student as he engages in the individual exploration periods. Students should inform the teacher if they wish to change directions and begin exploring another occupation.

A brief oral report about the occupation explored should be assigned to each student. Allow time for other students to ask questions pertaining to each report.

After completing this phase of individual exploration, each student is to be provided with directions for doing one or more activities pertaining to the occupation he has chosen to explore in depth, and provided with a place to conduct such activities. Make certain all materials needed are available.

Review the section in the Teacher's Handbook pertaining to the use of simulated learning activities, the roles of the teacher and of the student in these activities, etc. See the suggested activities at the end of this unit.

Allow each student sufficient time to complete his activity or activities. Get his reaction to the type of work one does in the occupation he has explored.

SUGGESTED ACTIVITIES

These are not the only activities that should be utilized. Plan other activities that could be used in exploring the various occupations.

Banking Occupations

Cashier
Clerk, country collection
Clerk, exchange
Clerk, interest
Clerk, mortgage
Clerk, reconcilement teller
Clerk, transit
Clerk, trust investment
Controller
Loan officer
Proof machine operator
Sorter

A. Arrange for an interview with a person in the specific banking occupation in which you have an interest. Prior to the interview, prepare a list of questions you would like to have answered during the interview such as, his duties, and how he became interested in his occupation. Read any information you can find on interviewing techniques, proper dress for an interview, etc. Collect any forms from him that relate to his specific occupation. Practice filling out the forms you acquired.

B. Have the occupational orientation teacher arrange for you to tour a bank. Write a report of the tour. Be prepared to give an oral report to the class.

Business Machines Occupations

Adding machine operator
Billing machine operator
Embossing machine operator
High speed printer operator

Bookkeeping machine operator
Calculating machine operator
Cardiotape converter operator
Clerk, accounting
Clerk, mortgage
Clerk, shipping
Clerk typist
Clerk, waybill
Console operator
Duplicating machine operator
Keypunch operator
Programmer
Sorting machine operator
Stenographer, court
Stenographer, general
Stenographer, technical
Tabulating machine operator
Tape perforator operator
Transcribing machine operator
Typist, data

A. Arrange for an interview with a person in the specific occupation in which you have interest. Prior to the interview, prepare a list of questions you would like to have answered during the interview such as, his duties, and how he became interested in his occupation. Read any information you can find on interviewing techniques, proper dress for an interview, etc.

B. Observe the business teacher give demonstrations on the use of various types of business machines – typewriter, adding machine, duplicating machine, etc. If possible, after observing the demonstrations practice using these machines using problems and projects provided by the teacher.

C. Learn the parts and some of the keys of the typewriter by going through the first ten lessons in a typewriting textbook. Have the occupational orientation teacher arrange to borrow a typewriter for your use, or arrange for you to participate in a typewriting class during the occupational orientation class period or a free period.

Economic Occupations

Economist
Economist, government industrial
Geographer, economic

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Have the occupational orientation teacher help you arrange an interview with the local Chamber of Commerce director. Acquire information from him on trends in employment, sales tax collections, business growth, etc. in your local community. Study your findings and write a report to turn in to the occupational orientation teacher. Prepare a chart illustrating the information you acquired. Be prepared to give an oral report to your class.

Insurance Occupations

Actuary
Claims adjuster
Clerk, policy change
Insurance checker
Policy writer

A. Arrange for an interview with a person in the specific occupation in which you have interest. (Refer to A under business machines occupations.)

B. Acquire books, pamphlets, brochures, and any other materials on the different types of insurance – health, liability, life, etc. Summarize the material after reading it by making a list of all types and giving a brief description of each.

Mailing Occupations

Mail carrier
Mail machine operator, handling
Mail machine operator, preparing
Postal clerk

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Have the occupational orientation teacher arrange to borrow the school's postal scale. After learning how to read the scale, practice weighing several pieces of mail and determine how much postage each requires.

C. With the occupational orientation teacher's assistance, arrange for a tour of the local post office. Acquire a list of postal rates for different classes of mail. Become familiar with these rates. Write a report relating to the tour.

D. Provide each of your classmates with three 3 x 5 inch cards. Have them address the cards as if they were actually going to mail them. Make sure they remember to add the zip code. Take up the cards and sort them in ascending order according to the zip code numbers.

Managerial Occupations

Clerk supervisor, shipping
Hospital administrator
Housekeeper, hotel
Manager, advertising
Manager, hotel
Personnel relations administrator
Production manager, advertising
Traffic manager, industrial

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Make a list of characteristics that you would want employees under you to possess. For example, initiative, honesty, loyalty, etc. Discuss this list with the occupational orientation teacher and ask for his advice as to other characteristics.

C. Prepare a plan of housekeeping for your classroom and/or laboratory which will involve all class members. Post the different assignments on the bulletin board. Carry through the plan under your direction.

Office Occupations

Accountant
Bookkeeper, general
Certified public accountant
Clerk, billing
Clerk, disbursement
Receptionist
Secretary, private
Secretary, social

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Have the occupational orientation teacher borrow the telephone company's senior high tele-training program for you. (It is a free service.) Ask him to also acquire the following free booklets from the same source: "How to Make Friends By Telephone," "The Voice With a Smile" and "Win More Friends By Telephone." He should contact:

Mr. J. E. Turbeville
State Public Relations Manager
South-Central Bell Telephone Company
P. O. Box 811
Jackson, Mississippi 39205

C. After observing the correct procedure to follow in wrapping a package to be mailed, practice wrapping several different sizes and shapes of packages. If supplies such as wrapping paper and string are not available in the classroom, bring some large brown paper bags and/or some newspaper and string from home.

D. Borrow a typewriting book from the business teacher. Study the illustrations in it on folding letters for small and large envelopes. Practice folding several letters for each type of envelope.

E. Interview the person(s) in a local business who is responsible for the billing and disbursement duties in his organization. Prepare a list of questions prior to the interview that you would like to have answered. For example, how often bills are mailed or payments made, if any advertising is enclosed with the bills, etc. Ask for any information he can give about billing and disbursement procedures. Write a report of your findings.

F. Acquire samples of the different types of forms used in filling out income tax returns. These may be gotten from a lawyer's office. Become familiar with these forms, and the purpose of each. Write for a social security card if you do not have one. Forms for requesting this card can be gotten from the post office in your town.

G. Borrow a bookkeeping textbook from the business teacher. Study the chapter on preparing a simple balance sheet. Ask the business teacher to explain any points you do not understand. Have the occupational orientation teacher assign you a simple balance sheet to prepare. Complete the problem and give it to the teacher for evaluation.

H. Read any information you can find on balancing a bank statement. A bookkeeping textbook is one source where this information can be found. The teacher will assign you a problem that involves balancing a bank statement. Complete the problem and give it to the teacher for evaluation.

Railroad Occupations

Conductor, passenger
Station agent
Telegrapher
Ticket agent

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Read any information you can find on railroad occupations. List the advantages and disadvantages of these occupations.

C. Acquire a train schedule from the local railroad station. Study the schedule. Ask classmates to be passengers and request information about scheduling trips to different locations. Provide them with all possible information they would need.

Retailing Occupations

Auto parts counterman
Auto service advisor
Cashier, box office
Cashier, checkout
Front office clerk, hotel
Salesperson, retail

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Have the teacher provide you with a copy of the free booklet, "Tips On Making Change," which can be procured from the following address:

Mr. D. T. Robinson
NCR Representative
519 North State Street
Jackson, Mississippi 39205

Study this booklet carefully. The teacher should supply you with play money so that you can practice making change. Have a classmate pretend to be a customer in a store. He will give you a certain denomination of money and you will make change according to the amount of merchandise he is pretending to buy.

C. Acquire sample sales tickets from several stores in your location. Ask someone in one of the stores to show you how to fill out the slip. Practice filling out the sales tickets you have accumulated.

D. Practice calculating sales tax for several different amounts of money. Have the teacher check your calculations for accuracy.

E. Secure some sample shop tickets from a garage in your town. Have someone in the garage show you how it should be filled out. Practice filling out the other samples you acquired.

Telephone Occupations

PBX operator
Telephone operator

A. Arrange for an interview with a person in the specific occupation in which you have an interest, or other telephone personnel. (Refer to A under business machines occupations.)

B. Have the teacher borrow the telephone company's senior high tele-training program for you. (It is a free service.) Ask him to also acquire the following free booklets from the same source: "How to Make Friends By Telephone," "The Voice With a Smile" and "Win More Friends By Telephone." He should contact:

Mr. J. E. Turbeville
State Public Relations Manager
South-Central Bell Telephone Company
P. O. Box 811
Jackson, Mississippi 39205

Miscellaneous Occupations

Employment interviewer	Tape librarian
Marketing researcher	Traffic agent, air lines
Purchasing agent	

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to A under business machines occupations.)

B. Activity for a student interested in the occupation of employment interviewer: Read any information you can find on typical questions asked during an interview. This information may be found in books on job interview which are in your school or community library. Have the teacher help you arrange for an interview with an employer or personnel director. Prior to the interview, make a list of any questions you would like to have answered during the interview. Interview a classmate as though he were applying for a specific job.

C. Activity for student interested in marketing research: Check out a book on marketing research or a marketing book from your school or community library. Study the chapter on data collection techniques. Study carefully the questionnaire method of data collection. Ask the distributive education teacher for assistance in securing any information or ask him to explain information you read but do not understand. Prepare a simple questionnaire to determine what percentage of your classmates receive an allowance, the average allowance received, and any other pertinent information. Ask the teacher to have the school secretary type a ditto master and run enough copies of your questionnaire so that all class members will have a copy. Have class members fill out the questionnaires. Compile the data from the forms. Write a summary of your findings.

D. Activity for a student interested in becoming a purchasing agent: Have the occupational orientation teacher help you arrange a visit to a manufacturing company, a restaurant, or the school cafeteria. Ask the person in charge of purchasing to help you make a list of the products bought for institutional use. Find out if they buy the products directly from manufacturing companies, order from catalogs, etc. Ask him to tell you how they decide which products to buy. Write a report of your findings. Be prepared to give an oral report.

E. Activity for a student interested in the occupation of tape librarian: Interview the school librarian to find out (1) how she stores records, tapes, etc.; (2) how she records them – card file, etc. – and if she codes them in any way. Find out all you can about her duties. Ask her to explain the use of the card catalog, and then study its "makeup" carefully. Using 3 x 5 inch cards, prepare several examples of cards with titles and any codes (Dewey Decimal System Code, Library of Congress numbers, etc.) that is used on the cards in the card catalog. File these in proper sequence in a small box. Ask the librarian to check your work for accuracy.

F. Activity for a student interested in becoming an airlines traffic agent: Read any information you can find on air travel. From the information gained during your readings, make a list of the advantages and disadvantages of this type of transportation. Interview a classmate as a potential customer and try to sell him on using the services rendered by an airline company.

EVALUATION

Evaluation is a vital part of any educational program. When evaluating student learning, behavioral change should be the first consideration. Dr. Richard D. Ashman, Professor of Distributive Education at the University of Minnesota, suggests in his article, "Evaluation of Projects and Project Outcomes," that student learning should be evaluated in terms of behavioral change, not evaluated just for grading purposes only. He also suggests that there must be evidence of growth or the activity is not worthwhile. "The teacher must know that the student has or has not learned," he states, "but more important the student must realize that he has learned or has not learned."

Determining what is known before an activity is begun is of primary importance. When this knowledge is determined, growth as a result of the activity can be measured.

Refer to "pretest" at the beginning of this unit when evaluating student behavioral change as a result of the activity or activities he completes.

Occupational Orientation is concerned with introducing students to the world of work. What is learned should be helpful to the student in making a wise occupational choice when he is encountered with this decision.

Some students' and teachers' evaluation tools have been suggested during this unit. There should also be a culminating evaluation at this point to determine (1) the behavioral changes produced by the presentation of the general information to the group and (2) the behavioral changes occurring from individual exploration of specific occupations.

Prepare an evaluation questionnaire to give to each student as he completes this unit. (See appendix C for a sample questionnaire.)

OCCUPATIONAL ENTRY PLANNING

Most occupational briefs and other printed materials will indicate educational preparation necessary for pursuit of this occupation as a career. Many schools or areas do not offer such educational courses or curriculums. Lead the students in discovering educational offerings in the local school and possible alternatives in planning a curriculum for organization occupations. Students may be able to get the desired courses not offered in the high school at one of the junior colleges or at a four-year college or university. Have each student examine college catalogs to discover where he may get the specific training or education necessary for successful entrance and advancement in his chosen occupation.

UNIT 5
TECHNOLOGY CATEGORY

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

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TECHNOLOGY CATEGORY

STUDENT OBJECTIVES

1. To be prepared to write a brief definition of the term "technology," and to list at least five occupations that are included in the technology category.

2. To study carefully the content of this manual in order to be able to tentatively select one or more occupations for detailed study.

3. To become involved in at least one realistic experience pertaining to each of the occupations tentatively chosen.

4. To be able to list several occupations in the technology category that you like the most, and to write at least one reason why you find each interesting.

5. To be able to identify at least several occupations that you like the least, and to write at least one reason why you dislike these occupations.

6. To be able to identify and list your special interests that would help in meeting requirements for success in occupations in the technology category.

7. To be able to identify and list your special abilities that would help in meeting requirements for success in occupations in the technology category.

8. To be able to identify personal limitations that may prevent success and satisfaction in occupations in the technology category.

TEACHER OBJECTIVES

1. To spend as much time as necessary to prepare students for the technology category by reviewing test interpretation and keys to self understanding, and by dealing individually and collectively with problems that may have arisen.

2. To identify what the students know about technology occupations before beginning the unit by giving a short test.

3. To define the term "technology" and to characterize it by using illustrations and examples.

4. To acquaint students with technology occupations by having them study the list with short explanations.

5. To show the students how occupations can be grouped according to amount of education and skills required, and the degree of responsibility one must assume.

6. To show the students how occupations in the technology category can be grouped by industries, families, and units of economic activity; to compare these occupations with each other.

7. To involve the students with in-class and out-of-class activities that will help them see the evidence, and importance, of technology occupations within their community.

8. To lead the students in a brief study of the nature of the work in technology occupations, where employment is found, education and skills required for entry and advancement (in these occupations), earnings, trends, and employment outlooks.

9. To lead the students in the study of typical personal requirements to be successfully employed in these occupations; to involve students in activities that will aid them in measuring their own personal traits and abilities in relation to these requirements.

10. To provide the opportunity for students to choose one or more occupations in the technology category and make a detailed study of it through the use of filmstrips, films, occupational briefs, career books, etc.

11. To provide students with realistic experiences that pertain to the technology category.

12. To provide students with any educational and occupational information needed to intelligently plan a career choice.

QUESTIONS RELATING TO THIS CATEGORY

1. What is meant by the term "technology"?

2. How are occupations in the technology category classified?

3. How can occupations in the technology category be clustered?

4. What is the importance of technology occupations?

5. What is the nature of the work?

6. Where is employment found in technology occupations?

7. What are the educational requirements for entry and advancement?

8. What is the employment outlook for technology occupations?

9. What are the typical personal requirements of those successfully employed in technology occupations?

10. How can the students explore occupations in the technology category?

11. What educational information is necessary for planning a career in technology?

Students were helped to appraise their personal characteristics, interests, aptitudes, abilities, and achievements at the beginning of this course of study. If this unit is far removed from that evaluation, there will need to be a review with particular emphasis on personal requirements for occupations in this category.

Arrange to give a pre-test before beginning the unit. See appendix A for a sample form. Study the Teacher's Handbook on the purpose and use of the pre-test.

WHAT IS MEANT BY THE TERM "TECHNOLOGY"?

A definition to cover all phases of technology is difficult because what is meant by the term "technology" varies from occupation to occupation and from employer to employer. However, technology usually includes special or practical knowledge, especially of a mechanical or scientific nature. Technology refers to this knowledge as applied to the "production, maintenance, and transportation of commodities and utilities, and to transportation and communication."[1] It is all of the means used by organizations to provide the material objects needed and wanted by people. In other words, technology is what is behind the producing of things for the consumer, including the design of the products, the mechanics of producing the products, and the servicing of these products.

Ask students for examples of experiences in designing and building a simple toy, or some other item. Have them tell what steps were taken to produce the item, and what tools and supplies were needed. Relate these experiences to the term "technology."

WHAT ARE THE OCCUPATIONS IN THE TECHNOLOGY CATEGORY?

Occupations in engineering, crafts (including repair work), and the machine trades, as well as in transportation and communication are included in this category. Some of those requiring training in the physical sciences are listed in this category.

These occupations require knowledge and use of scientific and mathematical theory, or specialized education or training in certain mechanical or scientific fields. These are the so-called "technicians" who usually work with scientists and engineers.

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[1] Anne Roe, The Psychology of Occupations (New York, 1956), p. 197.

HOW ARE OCCUPATIONS IN THE TECHNOLOGY CATEGORY CLASSIFIED?

Briefly review Roe's description of the six groups. Point out that the occupations can be classified according to amount of education required, and the degree of responsibility one must accept.

GROUP I

1. Aerospace engineer – designs, develops, and tests all types of aircraft and spacecraft.
2. Agricultural engineer – designs, tests, and develops equipment and methods to improve the efficiency and economy of the production, processing, and distribution of food and other agricultural products.
3. Ceramic engineer – develops methods for processing clay, silicates, and other nonmetallic minerals into glassware, cement, bricks, coatings for missile nose cones, and other ceramic products.
4. Chemical engineer – plans, designs, and constructs chemical plants and equipment; researches and develops improvements in production of large quantities of chemicals to place on markets; researches and develops synthetics rubbers and textile fibers, antibiotics, plastics, and other new or improved products.
5. Civil engineer – designs and supervises the construction of highways, bridges, airstrips, dams, sewage systems, and many other type structures.
6. Electrical engineer – designs, develops and assists in producing electrical and electronic equipment.
7. Industrial engineer – seeks the best uses of men, materials and machines in production processes in industry, including the selection of tools and machines, conducting motion and time studies, and planning work flow and work areas.
8. Mechanical engineer – designs and assists in the manufacture of internal combustion engines, jet and rocket engines, gas and steam turbines, nuclear reactors, and other motors and machines.
9. Metallurgical engineer – assists in processing metals to free them from other metallic or nonmetallic materials; studies the physical characteristics of metals and their alloys, and works with methods of developing these metals into finished products.
10. Mining engineer – assists in locating and removing iron, copper, limestone, gypsum, coal, petroleum, and natural gas from the earth; determines means for processing these minerals to remove unwanted substances.

GROUP II

1. Air traffic controller – gives instructions, advice, and information to pilots by radio in order to avoid aircraft collisions and minimize delays as planes fly between, or in the vicinity of, airports.
2. Computer programmer – works out instructions or "programs" to put in computers so that the machines will perform the desired operations in the proper sequence.
3. Dispatcher, airline – authorizes and regulates the safe and efficient flow of commercial flights by talking with the airplane captains through the use of radio equipment at the airport terminal and aboard the aircraft.

4. Aerospace engineer (the engineering occupations are listed in this group and differ only in the amount of education and degree of responsibility of the worker.)
5. Agricultural engineer
6. Ceramic engineer
7. Chemical engineer
8. Civil engineer
9. Electrical engineer
10. Industrial engineer
11. Mechanical engineer
12. Metallurgical engineer
13. Pilot – prepares flight plans; checks and operates aircraft controls, equipment, and instruments necessary for flying a plane, taking it off, keeping it on course, and landing it safely.
14. Systems analyst – studies problems of processing data and finding solutions to difficult business, scientific, and engineering problems through the use of electronic computers.
15. Technical writer – researches and interprets technical and scientific data, and organizes, writes, and edits this data so that the reader can understand it.

GROUP III

1. Appliance serviceman – uses ammeters, ohmmeters, voltmeters, manometers, pressure gages, and other test equipment to find out why washing machines, dish washers, refrigerators, toasters, and other appliances do not operate properly; uses pliers, special wrenches, and other hand tools to make necessary adjustments, replacements, and repairs.
2. Computer console operator – operates the computer while the data is being "run," manipulating switches and observing lights that signal the correct or incorrect function of the computer.
3. Computer personnel – people who keep the computer running and the paper processed, such as typists, card-to-tape converter operators, console operators, tape-to-card converter operators, high-speed printer operators, and tape librarians.
4. Airline dispatcher – authorizes, regulates, and controls commercial airline flights; studies weather information, computes fuel needed, prepares flight plans, cancels flights when necessary, and keeps a record of flights.
5. Draftsman – takes the ideas, rough sketches, specifications, and calculations of engineers, architects, and designers and makes working plans which can be used to construct buildings, highways, airplanes, and thousands of other products.
6. Ship engine occupations – first assistant engineer, second assist engineer, and third assistant engineer, electrician, wiper, oiler, water tender, and fireman who are responsible for engines, generators, motors, and other equipment that make up the engine room of a ship.
7. Engineering technician – assists the engineer or scientist in conducting laboratory experiments, developing test equipment and models, and making drawings and reports; uses mathematics while working with complex electronic and mechanical instruments.
8. Flight engineer – inspects aircraft tires, fuel tanks, and flight instruments before takeoff; watches and operates many instruments during the flight to check the performance of the engine, air-conditioning, pressure system, and electrical system; keeps records and reports mechanical failures.

9. Ground radio operator – transmits important messages about weather conditions and navigation between air dispatchers, air-traffic controllers, and other ground station workers and flight engineers, and pilots, or other flight personnel.
10. Layout man, machinists – studies blueprints and marks metals, using rules, scribers, and other hand tools to show the machine operator what and how much machining is needed.
11. Machinist – uses blueprints to plan and select tools and materials required to shape metals, and sets up the machines so that the operation can be performed; use scribers, calipers, micrometers scales, and gages to obtain accuracy in the work performed.
12. Pilot
13. TV-radio repairman – repairs and maintains electronic equipment such as radios, televisions, and tape recorders by checking tubes, soldering loose connections, and testing circuits with a volt-meter, ohmmeter, and oscilloscope; sets up and installs electronic equipment.

GROUP IV

1. Aircraft mechanic – corrects oil leaks, repairs landing gear malfunctions, tests radio and electronic equipment, changes oil, cleans spark plugs; inspects, services, and overhauls the engine; inspects, overhauls, and services wings, tail assemblies, control cables, and fuel and oil tanks.
2. Appliance serviceman
3. Arc cutter – uses an electric arc to trim or cut metals to desired specifications.
4. Auto body repairman – removes dents, scratches, and old paint; replaces metal sections, glass, and trim that cannot be repaired; uses a variety of hand and power tools to complete the job.
5. Auto mechanic – finds the cause of improper operation of the automobile using technical know-how and testing equipment; disassembles and overhauls engines, transmissions, clutches, and rear ends; grinds valves, adjusts brakes, and aligns front ends; adjusts, repairs, and installs alternators, starters, and other parts of the ignition system.
6. Boilermaker – uses power shears, power presses, oxyacetylene torches, welding equipment, hoists, jacks, and riveting machines to install and repair boilers, tanks, or vats.
7. Bookbinder – sets and operates folding, gathering, sewing, stitching, case making, covering, and trimming machines to put pages together and bind books.
8. Bricklayer – reads blueprints to check the specifications and lays brick in a straight manner, both horizontally and vertically, for walks, chimneys, and other structures; uses soft mortar, levels, gage lines, trowels, jointers, chisels, and brick saws to correctly do the job.
9. Broadcast technician – sets up, operates and maintains such radio and television station equipment as microphones, sound recorders, television cameras, magnetic video tape recorders, and motion picture equipment.
10. Cable splicer, electric power – installs and repairs underground lines by pulling the cable through conduits, joining it at connecting points, and wrapping insulation around the wires at the joints.
11. Cable splicer, telephone – works on high platforms, in manholes, and in basements to complete the connections of telephone cables after the lineman has placed them on poles or in underground conduits; maintains and repairs the cables.
12. Cameraman – starts the process of making a lithographic plate (offset printing plate) by photographing the copy of printed words or the copy of an illustration.
13. Stripper – arranges and pastes typed words, illustrations, and other art work on layout sheets to be photographed by the cameraman for offset printing plates.

14. Compositor – reads from a copy of printed material, selects the type and style of letters to be used for the job, and arranges by hand or machine the letters to be printed.
15. Printer pressman – prepares type forms and press plates for final printing by locking them into place on a platen or cylinder press, adjusts the ink flow on the press, provides paper for the "run," and tends the press while making the copies.
16. Reinforcing iron worker – sets steel bars in concrete forms to reinforce concrete structures by arranging and tying the bars so that each bar receives its intended load; uses steel pliers and other tools to wire the rods in place.
17. Carman – works in railroad shops, yards, and terminal buildings, maintaining and repairing railroad freight and passenger cars.
18. Conductor, freight – receives train orders from the railroad dispatcher and arranges departure time; arranges for repair of mechanical failures; keeps records of contents and destinations of each car, and sees that cars are collected and distributed along the route.
19. Locomotive engineer – operates the throttle, air brakes, and other controls of a railroad locomotive according to directions given by the conductor, outside signals, and the train radio.
20. Locomotive fireman – helps the locomotive engineer see that there is plenty of fuel, sand, water, flagging equipment, and tools on board; helps the engineer by looking for objects on the tracks, looks for fires, and occasionally takes over the controls from the engineer.
21. Carpenter – erects wooden buildings, forms for pouring concrete, concrete pouring chutes, and wooden scaffolding for use in erecting structures; uses hammers, saws, and other hand tools and power tools to cut, fit, nail, and join materials used in the structure.
22. Coremaker – prepares cores, usually of sand, which are placed in molds to form the hollows or holes usually required in metal castings from which products will be developed.
23. Molder – makes molds by packing and ramming sand around a pattern (a model of an object to be duplicated) in a molding box called a flask, using such tools as mallets and air hammers.
24. Patternmaker, foundry – studies a blueprint of the part to be cast, and makes a pattern, using wood or metal stock; uses such machine tools as lathes, planers, handsaws, sanders, and many hand tools.
25. Detailer – a draftsman who makes drawings of each part shown on a layout, giving dimensions, materials, and any other information necessary to make the drawing clear and complete for those who must produce the structure or object.
26. Electrician, construction – follows blueprints to install switches, wires, conduits, controls, circuit breakers, and other electrical parts in homes, industrial plants, and other structures.
27. Electrician, maintenance – reads blueprints of wiring, makes minor mathematical calculations, and cuts, bends, and splices wire and conduit; repairs or replaces wire, fuses, transformers, coils, and switches; makes prompt repairs in electrical equipment using test lamps, ammeters, and oscilloscopes.
28. Electroplater – studies specifications to find out what is to be metal plated, mixes a compound of the plating metal with chemicals, and determines the amount of electric current and length of time needed for the process; gets the item ready for electroplating by cleaning and covering areas not to be plated; immerses the object in the solution, and puts the object through the electroplating process; inspects the plate and measures the thickness with micrometers, calipers, and other test instruments.
29. Electrotyper – makes plates for book and magazine printing by the process of electroplating.

30. Elevator constructor – assembles, installs, and repairs elevators, escalators, and dumbwaiters.
31. Engine occupations, ship
32. Instrument maker – follows blueprints and sketches to make, modify, or repair timing devices, barographs, balance mechanisms, and other mechanical, electrical, or electronic instruments used in aircraft and missiles, laboratory testing, etc.
33. Instrument repairman – inspects, tests, and repairs such instruments as automatic pilots, seismographs, thermographs, and photographic recording instruments, using a variety of test instruments and hand tools.
34. Jeweler – makes by hand rings, necklaces, bracelets, and other precious jewelry out of gold, silver, or platinum.
35. Lather – installs metal lath, or large pieces of gypsum lath as support or holding material on which plaster, fireproofing, or tile can be applied to walls and ceilings.
36. Layout man
37. Lineman, electric power – erects power lines, splices or replaces wires and cables, replaces insulations, and transformers, replaces broken poles, and does other work to keep electricity flowing to consumers.
38. Lineman, telephone – digs holes, sets in telephone poles, attaches the cables to the poles; places cables in underground conduits; splices broken cables and replaces broken poles.
39. Machinist
40. Make-up man – assembles type and photoengravings in page form for the printing machine.
41. Marble setter – installs marble, shopmade terrazzo panels, artificial marble, and glass on walls and floors.
42. Mechanic, refrigerator, air-conditioning, and heating – installs, services, and repairs window air-conditioners, large central heating and cooling systems used in homes and commercial buildings, and display and walk-in coolers used in supermarkets; uses welding and solder equipment, test bulbs, hand tools, pressure gages, leak detectors, and other tools to work on compressor motors, heating elements, thermostats, piping and tubing, sheet metal ducts, and filters.
43. Meterman, electric – installs, repairs, and tests utility meters used in homes and large industrial and commercial establishments.
44. Meter reader, electric – checks and records the readings on the meter dials to determine how much electricity has been consumed for a certain period of time so that the customer may be charged for the amount used; reports improperly operating meters to the meterman.
45. Millwright – reads blueprints and schematic diagrams to move and install heavy industrial machinery using cranes, jacks, welding equipment, drills, and measuring equipment to prepare it for use.
46. Ornamental iron worker – assembles and installs metal stairways, catwalks, iron ladders, window sashes and doors, metal cabinets, and bank safety deposit boxes; uses wrenches, welding equipment, and other tools to fasten the iron to the structure.
47. Telephone and P B X (private branch exchange) installer and repairman – services and repairs private branch exchange systems, and telephones in homes, private businesses, etc., using wire cutters, screwdrivers, and other tools.
48. Plumber and pipefitter – installs pipe systems that carry water, steam, air, or other liquids or gases; uses soldering and brazing equipment, threading tools, wrenches, hammers, saws, and other tools to cut, bend, thread, and fabricate piping to be installed.

49. Structural iron worker – erects the steel framework of bridges, buildings, and other structures; pushes, pulls and prys the prepared steel beams and girders into position while the steel parts are being held by a crane or some other hoisting equipment; fastens the steel parts by riveting or welding.
50. Roofer – places asphalt, felt and hot tar, tile, slate, shingles, or some other material to waterproof roofs, walls, swimming pools, and other building surfaces; uses felt, knives, hammers, mops, and other tools to complete the job.
51. Set-up man – reads blueprints, job layouts, and specifications to get grinding machines, screw machines, lathes, drill presses, milling machines, and other machine tools ready for the operators to use while working with metals; uses micrometers, gages and other instruments to prepare the machine tool for use.
52. Sheet metal worker – reads blueprints and drawings to do sheet metal installation and repair work for ventilation, air conditioning, and heating systems, roofing, gutters, and other purposes; used measuring tools, hand and power shears, bending tools, punches, drills, files, and other tools.
53. Stationary engineer – observes meters, gages, and other instruments to interpret the operating conditions of large boilers, diesel, and steam engines, refrigerators, air conditioning machines, generators, turbines, pumps, and similar equipment used in large industrial plants and buildings; keeps records of temperatures and pressures; operates switches and levers, and regulates valves on this instrument.
54. Stonehand – works with composing type in a printing industry by arranging the type into a position in a metal frame in which it is locked into a position.
55. Stonemason – works with a set of drawings to set natural cut stone, such as marble, granite, or limestone, and artificial stone made from cement or other masonry material; works with a derrickman who helps put the stones in place; uses chisels, hammers, trowels, and brushing tools to put the stones in place, fill the cracks, and clean the stone.
56. Technician, engineering
57. Tool and die maker – makes and repairs devices which are used to hold metal while it is being shoved, stamped, or drilled by machine tools; makes gages and other measuring instruments to be used in making precision metal parts; uses machine tools and precision measuring instruments to make these devices.
58. Tool designer – prepares sketches of designs, or ideas, for making tools and devices, special fixtures and other items to be used in mass production articles.
59. Tracer – copies plans and drawings prepared by draftsmen by tracing them with pencil and ink, using the T-square, triangles, pens, and other instruments.
60. Troubleman, electric power – repairs wires, transformers, and other power equipment needing service during an emergency; uses wire cutters, special wrenches, and other tools and equipment to make the repairs.
61. Radio-television repairman
62. Watch engineer, electric power – supervises workers responsible for the operation and maintenance of boilers, turbines, generators, switchboards, transformers, and other power plant equipment.
63. Watch repairman – repairs, adjusts, and regulates watches, clocks, chronometers, electric-operating and other timepieces; uses a timing machine, demagnetizer, electric meters, and other equipment and precision tools to do the work.

64. Welder – joins metals by applying heat to melt the edges of the metals and cause them to fuse; uses arc, gas, resistance, and combination welding machines to do the work.

GROUP V

1. Arc cutter – cuts and trims metals, using a hand-guided or mechanically controlled electric arc torch.
2. Oxygen cutter – cuts and trims metals, using a hand-guided or mechanically controlled oxygen torch.
3. Welding machine operator – (see definition of welder) generally does not use more than one type machine, i.e. arc-welding machine.
4. Boiler operator, electric power – observes gages, meters, and other instruments mounted on boiler panels in steam electric plants and regulates the fuel, air and water supply in the boilers and keeps the proper steam pressure necessary for turning the turbines.
5. Turbine operator – observes pressure gages, thermometers, and other instruments on steam – or water – powered turbines which drive generators that produce electric power; records information shown by these instruments; shuts down and starts the equipment as directed by the switchboard operator.
6. Switchboard operator – controls the flow of electric power in the generating station from generators to the outgoing power lines; reads instrument panels and pulls switches to distribute the electrical power; gives orders when to start and stop the generators, and connects and disconnects them to the power lines.
7. Power plant equipment operator – checks and records the reading of instruments that indicate the operating condition of pumps, fans, condensers, water conditioners, compressors, and coal pulverizers in electric power plants; detects trouble, makes accurate judgments, and sometimes makes repairs.
8. Asbestos insulation worker – covers pipes, boilers, and other equipment with such insulation materials as cork, felt, fiberglass, asbestos, and magnesia; uses hand tools such as trowels, brushes, hammers, saws and pliers to cut, fit, and attach the insulation.
9. Brakeman, railroad – sees that the proper flags and signal lights are used; signals the engineer when to start and stop the train; throws track switches; inspects air brake equipment and looks for sparks, smoke, and other indications of sticking brakes, and overheated wheel bearings; sometimes assists the passenger train conductor by collecting tickets and looking after the needs of the passengers.
10. Bus driver, intercity – makes sure the bus is ready for passenger service by checking the oil, gas, water, and tires; drives the bus from city to city following time schedules and keeping within speed limits; supervises the loading and unloading of baggage; picks up and discharges passengers and picks up fares; prepares reports on mileage, time, and fares.
11. Bus driver, local – transports people to and from work, schools, and homes; makes regular stops every block or two to pick up and discharge passengers; collects change, tokens, tickets, or transfers; issues other transfers, sells tokens, and makes change; provides passenger information on routes, streets, and transfer points; keeps a record of trips made, fares received, and delays in schedule.
12. Business machine serviceman – maintains and repairs office equipment such as typewriters, adding and calculating machines, cash registers, electronic computers, dictating and transcribing

machines, and copy machines; uses pliers, screwdrivers, wrenches, calipers, meters, voltmeters, gages, and other instruments.

13. Floor covering installer – installs, replaces, and repairs tile, linoleum and vinyl, and carpeting on the floors of homes, businesses and other structures; uses knives, shears, tape measures, straightedges, chalk, adhesive trowels, and other tools to cut, fit, and install floor covering.
14. Glazier – cuts, fits, and installs plate glass, window glass, mirrors, leaded glass panels, and shower doors; uses glass cutters, putty knives, and grinders.
15. Inspector, manufacturing – examines raw materials, parts, assemblies, and the operation of massproduced finished products to see that they meet previously determined specifications or requirements.
16. Compositor – sets (composes) type by hand in a printing industry; selects the correct type and size type.
17. Linotype operator – uses a keyboard to select letters and other characters that form lines of type for manuscript copy; reads from a copy while striking the keyboard and operating a lever that causes the slug (metal with raised letters) to be deposited in a tray.
18. Monotype operator – operates keyboards similar to those on a typewriter which perforates ribbons of paper used to make type by the monotype caster.
19. Phototypesetting operator – sets type on a machine which produces a film or photographic print paper rather than a metal slug; presses keys, the individual matrixes, or mats, which contain small film negatives; feeds perforated paper tape, or a magnetic sound tape into a machine that "reads" the tapes and photographs the characters on the tapes.
20. Platemaker – works with zinc or aluminum plates used in offset printing; exposes the plate through the negative or positive to strong arc lights, usually done in a vacuum printing frame; develops and chemically treats the plate to bring out the image.
21. Pressman – gets the offset priinting press ready to print copy by installing the metal plate on the press, adjusts the pressure for proper printing, and adjusts the blankets which take the impression from the plate and transfer it to the paper; adjusts water and ink rollers, and mixes ink; manipulates the switches and levers while the press is running.
22. Proofreader – checks trial pages of typed copy against a proof before final copies are made; looks for misspelled words, improper sentences, and typographical errors; marks mistakes using a special code.
23. Stereotyper – makes duplicate molds or mats of paper-mache (a strong material composed of paper pulp) for letterpress in newspaper printing; operates a machine having heavy power-driven steel rollers to impress type and photoengravings on a mat; adjusts gages for time, heat, and pressure.
24. Load dispatcher – works in transmission and distribution departments at electric power substations and generating plants; observes meters and recorders, reads diagrams, and telephones instructions to the switchboard operators at the substations and generating plant in order to control the electric power and direct its flow throughout the system.
25. Machine tool operator – works with milling machines, lathes, grinders, drill presses, and screw machines to shape metals to precise dimensions; places metal stock in the machine; checks machine for proper functioning, and uses special gages to measure stock.
26. Painter – prepares the surfaces of buildings and other structures, and applies paint, varnish, enamel, and lacquer to these surfaces; mixes paints, matches colors, and erects scaffolding; uses spray guns, brushes, and rollers to apply the paint.

27. Paper hanger – prepares surfaces to be covered, measures the area to be covered and cuts wallpaper to size; mixes a paste and applies it to the reverse side; places the paper on the wall and smooths into place; uses rollers, cutters, and other tools to complete the work.
28. Plasterer – applies a plaster coating or stucco to walls and ceilings; applies three coats of the material to a backing to which the plaster sticks; uses trowels, straight edges, floats, and other hand tools to complete the work.
29. Power truck operator – operates self-powered trucks which have a hydraulic or electric-lifting mechanism to lift and move coal, cartons, machinery, lumber and other heavy materials and equipment.
30. Sheet metal worker
31. Stationary engineer
32. Stationary fireman – operates and maintains steam boilers used to power industrial machinery, and to heat factories; inspects equipment, lights boilers, cleans boilers, and oils and greases moving parts; maintains proper steam pressures by controlling the flow of air, gas, oil or powdered coal to the firebox.
33. Stonehand – arranges the type, cuts, and headings in a frame, or chase in proper order and locks it into place for direct-printing reproduction proofs of stereotype and electrotype plates used in printing.
34. Stonemason
35. Sub-station operator, electric power – directs the flow of electric current out of a substation by means of a switchboard; observes ammeters, voltmeters, and other types of instruments on the switchboard; operates levers to connect or break the flow of current; checks the operation of equipment.
36. Telephoner, telegrapher (railroad) – controls the movement of trains according to instructions given by train dispatchers; receives train orders from the train dispatchers and passes the orders on to the train crew; transmits information by Morse code, radio, telephone, and teletype.
37. Teletypist – transmits written messages by operating a teletype machine that has a keyboard similar to that of a typewriter.
38. Towerman, railroad – operates the controls which throw railroad track switches, and sets signals to route traffic according to train schedules or special routes.
39. Terrazzo worker – prepares ornamental concrete floors and patios using concrete, marble chips, metal strips, and other materials; uses a straightedge, trowel, electric-powered grinding machine, and other tools to level the concrete marble chips, metal strips, and to polish the surface after it hardens.
40. Tracer – makes corrections and prepares drawings for reproduction by tracing them on transparent cloth, paper, or plastic film.
41. Welding machine operator
42. Mechanic, diesel – repairs and maintains diesel engines used to power heavy trucks, ships and boats, locomotives, bulldozers, tractors and other equipment; inspects and tests engine components to see why an engine is not operating properly; rebuilds engines; repairs fuel injection systems, turbochargers, cylinder heads, starting systems, transmissions and other components; uses pliers, wrenches, value refacers, piston pin-fitting machines, dynamometers, and machine tools to test, replace, and repair parts.

43. Baker – produces bread, rolls, pies, cakes, doughnuts, cookies, crackers, pretzels, ice cream cones and other items; uses instruments to control timing and temperature; greases pans, mixes dough by hand, and removes bread in plastic bags; weighs and measures ingredients of pies, cakes, etc., and mixes them by machine.
44. Bookbinder – folds, sews, staples, or binds magazines, books, pamphlets, business forms, calendars, and other printed items; uses power presses, trimming machines, sewing machines, and other equipment to do the bindery tasks.
45. Assembler – works in the apparel industry; brings together and bundles garment pieces and other items (linings, tapes, trimmings) needed to make a complete garment.
46. Sewing machine operator – works in the apparel industry; uses sewing machines that have special attachments to sew on buttons, sew shoulder seams, attach cuffs to sleeves, sew hems, and other operations.
47. Checker – examines garments for proper workmanship.
48. Corrugator – regulates the speed of a paper machine that glues together paperboard with alternate ridges and grooves which is used in the manufacture of shipping containers.
49. Digester operator – determines the amount of chemicals to be used and the cooking temperature and pressure to be maintained in a digesting machine used in the wood-pulp industry; directs the loading of the machine with wood chips and chemicals to be used in the digesting machine.
50. Stillman – operates distillation units used in processing crude oil in a petroleum refining industry; watches instrument readings and regulates the flow of air and changes in temperature and oil pressure.
51. Pumpman – maintains and operates power-driven pumps that circulate processed and unprocessed petroleum products, and chemical solutions throughout an oil refinery plant.
52. Brakeman, freight
53. Cement mason
54. Coremaker helper – helps to make sand cores used in molds to form holes or hollows in metal castings.
55. Frameman – connects wires from telephone lines and cables to distributing frames in telephone company central offices, using soldering iron and other hand tools.
56. Groundman – helps in the erection of utility poles and the installation and repair of overhead power lines and communication lines.
57. Hod carrier – supplies the bricklayer, plasterer, or stonemason with bricks, concrete, mortar, or plaster.
58. Mechanic, diesel
59. Meter reader
60. Painter, production – uses a spray gun to apply coats of paint or other protective material such as enamel, lacquer, and stain; cleans surfaces, mixes paint, and loads and adjusts the spray gun.
61. Plaster
62. Power shovel operator – operates a power-driven machine that has a movable shovel that lifts and dumps dirt, rock, sand, and other materials.
63. Bulldozer operator – operates a tractor that has a blade across the front to move dirt, and to push trees and rocks from an area.

Ask students if they can think of other occupations that might fall in this category. List these on the board. Determine if occupations of parents of students are technology occupations.

Identify occupations in the technology category that require varying degrees of skills and knowledges in operating equipment, using tools, diagnosing mechanical problems, repairing machinery and equipment, and designing and testing tools and equipment. Point out the relationship of these skills and knowledges to subjects taught in high school.

Have students list tools that they have used, equipment they have operated, and other experiences they have had that relate to technology.

Have students bring to class articles they find in popular magazines that give technological occupational information. File these for later reference.

HOW CAN THESE OCCUPATIONS BE CLUSTERED?

Specific details of each of the occupations in the technology category will not be given in this publication. A brief description of broad areas of work should serve to orient students for later exploration. The foregoing occupations are regrouped by fields or families of occupations, or by geographical locale. Several sentences on each family briefly describe essential features such as the importance of the occupation, training and education required, and the occupational outlook. The Occupational Outlook Handbook gives much detail on all the following:

CIVIL AVIATION

1. Aerospace engineer
2. Engineering technician
3. Air traffic controller
4. Pilot
5. Airline dispatcher
6. Flight engineer
7. Ground radio operator
8. Aircraft mechanic
9. Teletypist

The airline industry is very vital to our society. Our people are becoming increasingly mobile, and are relying upon quick, safe, and comfortable travel. Air freight is becoming increasingly important for the quick delivery of manufactured goods to the people. In 1966 about 375,000 people were employed in civil aviation occupations. Of these, 211,000 were employed by the 49 scheduled airlines. Most work in and around cities.

A high school education is required for most aviation occupations. Aerospace engineers have four years of college, and some do post-graduate work. Airlines usually have their own requirements for personnel and some do their own training.

History, social studies, economics, and other high school subjects introduce some information concerning civil aviation. The airplane is a product of science. Much science has gone into the development of aircraft and related equipment. One who is interested in occupations in the aviation field should take courses in physical science (mathematics, physics, chemistry, etc.).[1]

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[1] Stuart G. Tipton. "Air Transportation," Encyclopedia of Careers and Vocational Guidance. (Garden City, New York) I, 89. ed. William Hopke.

About 184,000 general aviation aircraft may be flying by 1980–an increase of about 88,000 over the number in 1966. This increase will create a need for many pilots, mechanics, and other personnel.

Show a film to the class that portrays information about aviation occupations. This film should characterize several aviation occupations. Some films are listed in the bibliography.

CONSTRUCTION

1. Civil engineer
2. Engineer technician
3. Draftsman
4. Carpenter
5. Elevator constructor
6. Bricklayer
7. Lather
8. Marble setter
9. Ornamental iron worker
10. Reinforcing iron worker
11. Structural iron worker
12. Plumber and pipe fitter
13. Roofer
14. Stonemason
15. Asbestos insulation worker
16. Floor covering installer
17. Glazier
18. Painter
19. Paper hanger
20. Plasterer
21. Terrazzo worker
22. Cement mason
23. Hod carrier
24. Power shovel operator
25. Bulldozer operator
26. Power truck operator (may be found in other industry)
27. Tracer, draftsman

We see evidence of the construction industry in the homes we live in, the factories, offices and schools we work in, and the roads we travel on. Over four million people are employed in construction work. Craftsmen (carpenters, painters, plumbers, bricklayers, etc.) and foremen make up about one-half this number. The construction industry supports many other industries by using a great volume of their materials and equipment.

Most of the construction occupations require physical activity. It has been called a "man's type of work." Working conditions are hot in the summer months and cold during the winter months. It offers many opportunities for creativity. It offers workers a chance to move about–sometimes many miles to new jobs. Many are self-employed and do only local work.

Students planning to enter one of these occupations should plan to take as many courses in mathematics and science as possible. Courses in woodworking and mechanical drawing would be extremely helpful. Many construction workers enter the field through apprentice training (a period of on-the-job training supplemented by classroom study in tool use and care, mathematics, geometry, etc.). Others enter the field as laborers, or helpers and learn the trade by working with experienced craftsmen. Still others attend vocational schools to learn the trade. It may take several years to learn the skills necessary to be a carpenter, bricklayer, marble setter and other occupations.

A construction trade craftsman may advance to be a job foreman, an estimator, job superintendent, salesman for a building supply company, or may even form a construction company and contract jobs. However, the contract construction field is very competitive.

The employment outlook for construction workers is very promising. New highways and bridges are being built at an increasing rate. Many new homes and apartment buildings are being built, particularly in the suburbs. Buildings for schools, businesses, and industries will be needed. Such structures will create many job openings. Also, there seems to be relatively few young people entering the construction occupations, creating a shortage of laborers as well as skilled workers.

Show a film that portrays occupational information in the construction industry. Some films from which to select are listed in the bibliography.

Invite a contractor to speak to the class on the advantages and disadvantages of working in construction occupations. Tape this talk to use in later classes.

Involve the students in developing a study display relating to construction occupations. Use work samples and work tools in projecting these occupations. Use pictures, drawings and other materials.

Arrange for a field trip to a construction site at which several workers listed in this group are employed.

Have each student interview one person who is working in construction trades. Develop an interview guide for the students to use. Have the students make a brief report to the class.

Invite a resource person to speak to the class about several construction occupations. You may wish to tape this talk for use in later classes.

ELECTRIC POWER INDUSTRY

1. Electrical engineer
2. Engineer technician, electrical
3. Cable splicer
4. Electrician, construction
5. Electrician, maintenance
6. Lineman, electric power
7. Meterman, electric power
8. Meter reader, electric power
9. Troubleman, electric power
10. Watch engineer, electric power
11. Boiler operator, electric power
12. Turbine operator, electric power
13. Power switchboard operator
14. Powerplant equipment operator
15. Substation operator
16. Groundman

Nearly every American home, business, and community is dependent upon electricity. It takes electric power for our communication systems, mechanized industries, and to run the appliances in our homes. Almost one million people are employed in producing electricity at generating plants and in distributing electricity at substations and electric utility companies in almost every locality.

Beginning power plant workers may be required to do cleanup jobs or help in order to become familiar with the equipment and operation of a power plant. They advance to the more responsible positions as openings occur and as they master skills. For example, it takes from one to three years to become an auxilliary equipment operator (fans, blowers, condensers, compressors, water conditioners, etc.), and four to eight years to become a boiler operator, turbine operator, or switchboard operator. Applicants are generally required to have a high school education or its equivalent. Formal apprenticeships in these jobs are rare. Workers employed in atomic-powered electric plants must have special training to work with fissionable, radioactive fuel.

Most transmission and distribution workers begin as helpers and advance to the more responsible jobs. For example, substation operators begin as assistant or junior operators. Advancement to the job of operator may take three to seven years. Skilled linemen usually have about four years of on-the-job training. In some companies, this training is available through formal apprenticeship programs. Applicants for line work should be strong and in good physical condition. Linemen climb poles and work in high positions, many times with live wires surrounding them. They may be working during hot, cold, or wet weather conditions. They life heavy wires and equipment.

Metermen and meter readers begin their jobs as helpers in the meter repair shops. About four years of on-the-job training is necessary to become a fully qualified meterman.

Most electrical engineers, electrical engineer technicians, and maintenance electricians are employed in industries other than electric-power industries. About five years of college are required for electrical engineers. Construction electricians and maintenance electricians may receive training in vocational programs in high school or junior college. However, many begin work as helpers and receive their training on the job.

High school students interested in pursuing a career in the electric-power industry would do well to take mathematics, physics, and chemistry.

TELEPHONE

1. Cable splicer
2. Lineman
3. Telephone and P B X installer and repairman
4. Frameman

More than 385 million (local and long distance) telephone calls are made daily in the United States. More than 100 million telephones were in use in 1967. This takes a tremendous network of telephone lines and cables to supply telephone service to millions of Americans. Those who work in connection with the construction, installation, and maintenance of telephone lines and equipment are vital to the telephone industry. They make up about one-third of the total work force in the electric-power industry.

These jobs may be found in almost every community. Most are employed in large cities with many industrial and business establishments. The Bell System serves about five of every six of the nation's telephones. The remainder are served by independent companies.

Applicants for jobs in the telephone industry must have at least a high school education. Many organizations are requiring that applicants have two years of study at a junior college. Applicants for jobs as linemen and cable splicers should be physically qualified for such work. (Their work is similiar to electric-power linemen.) Manual dexterity and the ability to distinguish color are also important qualifications. The telephone companies generally do not require previous experience or training for these jobs. They train their own employees.

Employment opportunities for cable splicers and linemen may be somewhat limited because of new developments that enable the telephone companies to provide increased efficiency in service. The same will be true for P B X installers, repairmen and framemen.

High school students desiring to work in these occupations would do well to take courses in mathematics and physics. Basic electricity and electronics would be helpful in preparing to enter these occupations.

MACHINING AND MACHINERY (METAL WORK)

1. Mechanical engineer
2. Industrial engineer (also found in other industries)
3. Layout man
4. Machinist
5. Arc cutter
6. Millright
7. Set-up man
8. Instrument maker
9. Tool and die maker
10. Tool designer
11. Oxygen cutter
12. Machine tool operator
13. Inspector
14. Welder
15. Sheet metal worker

Almost every product made by American industry contains metal parts, or is made by machines made of metal parts. About 500 different types of machine tools are in use today by more than one million people employed in the machine industry. Machining workers (those who shape metals using machine tools) make up the largest occupational group in the metal-working trades. About four-fifths of all machining workers are employed in the metal-working industries. Many work in non metal-working industries such as railroad shops, and maintenance shops of factories that make textiles, paper, glass, or chemicals.

Many of the workers in machine and machinery occupations are identified with the machines they operate. People who work in these occupations work in a mechanized environment. They may be required to work with the same equipment for long periods of time, i.e. the arc cutter. However, some workers may be involved in several series of machine operations. For example, the machinist may work with several different types of machine tools, and be required to perform several jobs on each machine tool.

Workers such as millrights, layout men, tool designers, and inspectors require dealing with complicated work specifications.

Those who desire to enter machine and machining occupations should have an interest in watching machines in operation. They should have an interest in how machines function.

Industrial engineering and mechanical engineering require about five years of college leading to a bachelor's degree. They may receive on-the-job training before actually assuming major responsibilities. Arc cutters, oxygen cutters, machine tool operators, and inspectors usually learn the trade through experience under the supervision of craftsmen. Tool and die makers, instrument makers, machinists, millrights, and set-up men may receive their experience and training through an apprenticeship program. Layout men may be required to complete an apprenticeship program as a machinist and have several years of experience to develop the necessary skills for this occupation. Persons interested in machine or machinery occupations should have a good mechanical aptitude and a liking for machinery.

Mathematics and science courses would help prepare one for these occupations. Metal trades, welding, and machine shop courses will help prepare students for entrance into work as sheet metal workers, oxygen cutters, arc cutters, welding machine operators, and machine tool operators.

Employment opportunities may be limited in some machine or machinery occupations because of technological developments in machine tools and machinery. Automated machining lines in which machine tools are linked together for production operations are being used. Numerically controlled machine tools are being increasingly used. Such automated equipment will replace some machine operators, but there will be a need for trained personnel to operate this equipment.

DATA PROCESSING

1. Computer programmer
2. Systems analyst
3. Computer console operator
4. Computer personnel

Note: this includes only a few data processing occupations. More are included in other categories.

Electronic data processing is one of the newest developments in our technological society. Electronic data processing systems are used in schools, hospitals, private businesses, industries, airports, government agencies, and many other fields of endeavor. These systems aid in getting bank statements to individuals on time. They guide machine tools while they cut metal to an exact size and shape. They guide space vehicles while they orbit the moon.

In 1966, more than 100,000 people were employed to operate this equipment. Another 100,000 were employed as programmers. More than 60,000 were employed as systems analysts. Most jobs are found in government agencies, insurance companies, banks, wholesale and retail stores, airports, electric-power companies, telephone companies, manufacturing firms, and independent service organizations which process data for other firms on a fee basis.

Computer console operators usually are required to have at least a high school education. They may receive special training that lasts for several weeks in order to qualify them for the job. Requirements for computer programmers and systems analysts are somewhat varied, depending upon the field of work. But, many have college degrees in business administration, mathematics, science, engineering, and accounting. Junior college preparation in data processing may well prepare one for beginning positions.

Students desiring to enter this type work may do well to take algebra, geometry, trigonometry, and physics while in high school.

Many thousands of new jobs will be available during the 1970's for those who have the aptitude and desire to work as computer operators, programmers, and systems analysts. But, it is rapidly changing work. Skills acquired now may not be adequate for a long period of time. New developments in computer equipment will require the acquisition of greater knowledge and new skills.

PRINTING AND RELATED OCCUPATIONS

1. Cameraman
2. Stripper
3. Electrotyper
4. Compositor
5. Make-up man
6. Printer pressman
7. Stonehand
8. Linotype operator
9. Monotype operator
10. Phototypesetter
11. Platemaker
12. Pressman
13. Proofreader
14. Stereotyper
15. Technical writer
16. Bookbinder

The American people depend heavily upon printed materials as a communication media. Many rely upon the newspaper as a means for keeping up with world affairs. The textbooks and other printed materials used in school enable students to absorb knowledge and information vital to educational growth. Much work goes into the writing, editing, printing, and duplication of printed matter.

The printing industry is one of the largest service industries in our nation. Approximately one million people are employed as cameramen, printing equipment operators, proofreaders, and in many other printing and related occupations. Most towns of any size have some provisions for printing products including newspapers, books, and pamphlets. New technological developments will enable the printing industry to print better materials and will provide means for more colorful illustrating of printed materials. New skills will be required in this respect.

Apprenticeship is the most common method for entering these occupations. However, technical writers usually are required to have a bachelor's degree in English, journalism, engineering, or science. A thorough knowledge of spelling, punctuation, the fundamentals of grammar, and basic mathematics is essential in many of the printing occupations. Some knowledge of chemistry, electronics, and physics is becoming increasingly important.

Students who are planning to enter printing occupations immediately after high school may prepare by enrolling in the vocational offset printing course, or the cooperative education program.

Employment of lithographic (offset printing) craftsmen is expected to grow. However, the employment of linotype operators, hand compositors, photo-typesetting operators, and bookbinders will most likely decrease because of rapid developments in printing processes and equipment and the increasing use of other printing methods. Also employment opportunities for electrotypers and stereotypers may be limited.

RAILROADS

1. Carmen
2. Conductor, freight
3. Locomotive engineer
4. Locomotive fireman
5. Brakeman, railroad
6. Telephoner – telegrapher
7. Towerman

Railroads reach about 55,000 communities in all parts of the country with their network of 200,000 miles of lines. In 1965 about 750,000 people were employed by 570 railroad companies with property and other investments exceeding $50 billion. The railroads transport food, household appliances, lumber, coal, petroleum products, pulpwood, automobiles, aircraft and space equipment, and many other products. The railroads also transport about 300 million passengers each year.

Most railroad companies prefer to hire people who have graduated from high school. Most companies train their own workers.

The seniority system is well founded in most railroad companies. For example, openings for conductors are filled on a seniority basis by promotion of a qualified brakeman. Immediate opportunities for careers after high school as freight conductors and locomotive engineers are limited. Most new employees in the railroad industry start by working with experienced men and advance to other positions with experience.

Plan a field trip to a railroad station and a railroad yard. Arrange to go when activity is at a peak. Observe the duties of workers in railroad occupations listed in this category.

Select a film to show to the class that portrays duties and pertinent information about railroad occupations.

MECHANICS AND REPAIRMEN

1. Ship engine occupations
2. Automotive mechanics
3. Auto body and fender repairman
4. Radio-television repairman
5. Instrument repairman
6. Stationary engineer
7. Stationary fireman
8. Refrigeration, air conditioning, heating mechanic
9. Diesel engine mechanic
10. Business machine repairman
11. Appliance serviceman
12. Aircraft mechanic
13. Maintenance electrician
14. Millright
15. Watch repairman

Mechanics and repairmen keep automobiles, ship engines, watches, televisions, typewriters, washing machines, airplanes, and industrial machinery in good condition. These people represent one of the fastest growing occupational groups. Most are highly skilled people who have had to invest several years in learning the trade.

In 1966 there were about three million mechanics and repairmen. Almost one-third of these (785,000) were automotive mechanics such as car, truck, and bus mechanics, and automobile body and fender repairmen. More than 100,000 were employed as appliance servicemen, industrial machinery repairmen, television and radio repairmen and aircraft mechanics. About 650,000 workers were employed as maintenance electricians, millrights, watch repairmen, stationary engineers, and stationary firemen.

radio-television and appliance shops, and in many shops that specialize in servicing machinery and equipment.

Most mechanics and repairmen are highly skilled workers. A high school education is often required for employment as mechanics and repairmen. A good mechanical aptitude and manual dexterity are essential for satisfaction and success in these occupations. Watch repairmen need patience, finger dexterity and good vision. Millrights need to be strong and agile.

Many mechanics and repairmen learn their knowledges and skills through vocational and technical programs in high schools and junior colleges. Others learn their skills on the job, or through apprenticeship programs.

High school students contemplating entering one of these occupations should consider taking such courses as mathematics, machine shop, mechanical drawing and blueprint reading, chemistry, and physics. Many high schools offer automobile mechanics, auto body and fender mechanics, diesel engine mechanics, and other vocational courses for those who wish to begin work immediately after graduating from high school. The public junior colleges offer courses in refrigeration, air conditioning, and heating; business machine repair; aircraft mechanics; maintenance electricity (industrial electricity); watch repair; radio and television repair; and other vocational and technical programs that prepare students for work in mechanics and repair occupations.

Employment of automobile mechanics, aircraft mechanics, diesel mechanics, radio and television repairmen, appliance servicemen, business machine repairmen, and instrument repairmen will increase rapidly within the next ten years. Employment as ship engine workers, auto body and fender repairmen, millrights, maintenance electricians, and watch repairmen will not increase as rapidly. However, there will be a variety of career opportunities open to young men who are mechanically inclined and are willing to invest a few years in learning the skills and knowledges of a trade.

ENGINEERING AND RELATED

1. Aerospace engineer
2. Agricultural engineer
3. Ceramic engineer
4. Chemical engineer
5. Civil engineer
6. Electrical engineer
7. Industrial engineer
8. Mechanical engineer
9. Metallurgical engineer
10. Mining engineer

Most engineering and related occupations are included in the groups that have been discussed. However, engineering is the second largest professional occupation, exceeded only in size by teaching. It is the largest profession for men. Therefore, additional occupational information beyond what has been given is essential. It is also one of the fastest growing professions.

Approximately 980,000 engineers were employed in the United States in 1966. About half of these are employed by manufacturing industries producing aircraft, industrial machinery, chemicals, electrical equipment, etc. Many are employed by federal, state, and local government agencies. More than 30,000 are employed by educational institutions.

The Dean of the School of Engineering of the Massachusetts Institute of Technology, Gordon S. Brown calls engineering the "organized forcing of technological change." A recent definition is that engineering "applies the concepts and discoveries of science to the practical needs of the community."[2] Our technological society is a product of the "engineering" of science discoveries. The engineer is required to be motivated toward purposeful action. He is required to be knowledgeable, particularly in the field in which he is working. This knowledge is put to use in developing or improving products, devices, systems, processes, or constructions. Some engineers are required to reduce the theoretical work of the scientist or engineer-scientist to something that is practical and useful. This may be done in laboratories or industrial establishments. Still other engineers are engaged in work that involves great responsibility and technical decision-making but do not introduce new developments. Fields of technical work such as air flight, drafting, surveying, and radio operating is closely related to engineering.

People successful in engineering and related occupations usually have high interest in physical phenomena. This is important because they must be directly involved in intellectual, mechanical, and scientific activities. Most achieved high grades in science and mathematics while in school. Many were in science clubs and participated in science fairs, engineer fairs, and other activities while in school.

OTHER TECHNOLOGY OCCUPATIONS THAT MAY BE CLUSTERED

Several occupations that are listed in the technology category have but few, if any, related occupations that form a family or cluster. Occupations that are related and have common characteristics, or are found in the same industry are listed in other categories. Therefore, no effort has been made to provide information in this manual about the following occupations. The Occupational Outlook Handbook gives much detail on all the following:

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[2] United States Department of Labor, Counselor's Desk Aid, (Washington, 1967), Page 6.

PULP AND PAPER INDUSTRY

1. Corrugator
2. Digester operator

PETROLEUM, NATURAL GAS

1. Stillman
2. Pumpman

APPAREL INDUSTRY

1. Assembler
2. Checker
3. Sewing machine operator

AGRICULTURE

Agricultural engineer

JEWELRY

Jeweler

DRAFTING

Draftsmen (all types)

FOUNDRY

1. Patternmaker
2. Molder
3. Coremaker

CHEMISTRY

1. Chemical engineer
2. Electroplating

BAKING

Baker

METALLURGY

Metallurgical engineer

SHEET METAL

Sheet metal worker

CERAMICS

Ceramic engineer

RADIO AND TELEVISION BROADCASTING

1. Broadcast engineer
2. Broadcast technician

Have students do outside reading to determine the wages of workers in the technology occupations. Have them report to the class on occupations that offer the highest salaries and serveral that do not offer high wages.

Arrange for a class tour of trade and industrial education shops in your school, or at a vocational technical center at a junior college.

Invite the machine shop instructor, welding shop instructor, and other vocational shop instructors to talk to the class and with individuals. These instructors can provide information about their course offerings and their work experience before accepting teaching positions.

Invite one or more of the trade and industrial education students to visit the class to discuss the training they are receiving, and to answer questions.

Invite the president or other officer of the local Trade and Industrial Education Club to discuss club activities.

Have students interview people that are employed in technology occupations. These may be people that they live close to or otherwise know well. An interview guide should be available for use in planning the interview.

Arrange field trips to industries where students can observe workers performing their duties on the job. You may wish to divide the students into small groups to observe special aspects of the operations and work patterns – specialized work being performed, skills required, training necessary to do this work, machines used, and other characteristics of the work. You may wish to take a tape recorder along to record the sounds of the industry and the dialogue between the workers, students, and other people involved in the tour. This tape can be used for later classes.

Invite several resource people to talk about technology occupations. You may wish to have several resource persons to act as a panel.

Have a student make a list of businesses and industries on the chalkboard as the class names local businesses and industries that employ people in technology occupations.

Invite a representative from the local Employment Security Commission office to discuss employment opportunities and other local occupational information.

Discuss the effects technological developments will have on occupations in this category. Include the changing nature of work and education and training requirements. Ask the students to write a paper on "The World of Work in 2,000 As I Think It Will Be." You may want to share the better papers with the class.

Have students make a career bulletin board depicting (in words and pictures) the vocational subjects offered at your school that would help prepare students for careers in technology occupations.

Select several films portraying career information about technology occupations. Some films are listed in the appendix.

WHAT ARE THE TYPICAL PERSONAL REQUIREMENTS OF THOSE SUCCESSFULLY EMPLOYED IN TECHNOLOGY OCCUPATIONS?

The single most important requirement of workers in technology occupations is that they be able to adjust to a mechanized environment. In most instances, the work is done inside a building. Although there are exceptions, such as the technical writer, technology workers are required to work with equipment and a variety of tools. This equipment ranges from sophisticated electronic computers and automobile engines to power saws and drill presses. The occupations in this category require a great variety of knowledges and skills. Many occupations in other categories required high ability to work with people, particularly the service and business contact occupations. Most technology occupations require less contact with people and high ability in working with equipment and tools. However, being able to get along with the employer and fellow workers and working in groups or teams are very important in technology occupations as in other occupations.

Most technology occupations require ability in spotting equipment failures, or improper function. The worker may simply report this and someone else makes the necessary adjustments of repairs, or the worker may be required to do this himself. In other words, the worker may or may not be required to know a lot about the equipment with which he is working.

The following are additional requirements of most technology occupations:

1. Good coordination in the use of fingers, arms, feet, and eyes to operate levers, push buttons, and to use hand tools.
2. Good spatial and form perception.

3. A sense of responsibility for the safety of people (This is not a typical requirement of all occupations, but a very important requirement for many.).
4. A sense of responsibility for equipment and materials.

HOW CAN THE STUDENTS EXPLORE OCCUPATIONS IN THE TECHNOLOGY CATEGORY?

The content suggested thus far, participation in the activities in the classroom, and the knowledge gained from outside assignments should have prepared each student to tentatively select and explore one or more occupations in the technology category.

Study the Teacher's Handbook which explains the procedure for individual exploration.

Devise a check sheet or a progress chart for use in keeping a record of what the students are doing during the individual exploration periods. Students would simply check with the teacher each time they change direction and begin exploring a different occupation. This may also be used for keeping records of all activities in which the students are involved in each unit.

OCCUPATIONAL INFORMATION

This manual has provided a brief description of occupations and general characteristics on clusters or groups of occupations in the technology category. This has given students enough information to intelligently make a tentative choice of one or more occupations to explore in depth. The classroom library has detailed information on each of the occupations in the technology category.

Students will use the Occupational Outlook Handbook, Dictionary of Occupational Titles, occupational briefs, films and filmstrips, tapes, and other materials to study the characteristics of specific occupations. This will be done during the class period and through outside reading. An occupational study form will be used during the study as a guide to pertinent information for which to look.

This is the beginning phase of individual exploration. Be sure that the students fully understand where the materials are located, and how they are to be used. Study the Teacher's Handbook for information on how the students may get maximum benefit from exploration of printed materials, films and filmstrips, tapes, etc. See Appendix B for a suggested report form for use by the students when exploring an occupation.

When the students have had some time to do research on one or more occupations, let them make brief oral reports on their findings. The report form will serve as a reference sheet in making their presentations.

SUGGESTED ACTIVITIES

Students should know what the typical day is like in occupations they have selected to explore. Students should be involved in experiences related to these occupations that would help answer the following questions:

1. With what kinds of tools, machines, and materials would I be working?
2. What type tasks or jobs will I be doing?

3. Will I be dealing with data? Mathematical formulas?
4. With what kind of people will I be working?
5. Will I have to stand, sit, climb, balance, kneel, stoop, crouch, reach, lift, carry, push, talk, see, or hear?
6. Will I be working in hot, cold, dry, wet, noisy, dirty, indoor or outdoor conditions?
7. Will I be exposed to bad odors, mechanical hazards, moving objects, burns, electric shock, explosives, or other hazards?

The student should choose activities from the following list that are related to the occupations he has selected.

This is the second phase of individual exploration. Study the Teacher's Handbook for descriptive information on the purpose of mock or simulated activities, and instructor and student roles during these activities. Arrange for the students to be in contact with several of the following exploratory experiences that relate to occupations that they have chosen to explore in depth.

CIVIL AVIATION

1. Arrange to visit an airport to make an on-sight observation of the work carried on by civil aviation workers. Plan to talk with someone employed in the specific occupation in which you are interested. Ask to see some of the "paper work" they are required to do. Also, ask the dispatcher or traffic controller for an airline schedule of arrivals and departures.
2. Arrange to see one of the following films:
    a. Aviation – The Career For Marc. Available from the National Institutes Inventory of Resources Industrial Arts, Michigan State University, East Lansing Michigan 48823. 18 min. $6.50 rental charge.
    b. Aviation Mechanic (FA-315). Available from the Federal Aviation Administration, Film Library, AC-921, Aeronautical Center, P. O. Box 25082, Oklahoma City, Oklahoma 73125. 17 min.
    c. Traveler Meets Air Traffic Control. A (FA-102). Available from Federal Aviation Administration, Film Library, AC-921, Aeronautical Center, P. O. 25022, Oklahoma City, Oklahoma 73125. 28 min.
3. Read the following book:
    Neal, Harry E. Skyblazers: Your Career In Aviation. (1958) available from Julian Messner, 1 West 39th Street, New York, New York 10018. Price $3.64

CONSTRUCTION

1. Study carefully the construction of the lot, foundation, floor, walls, ceiling, and roof of your home and school. List the occupations that were represented in the construction of these buildings.
2. Arrange to visit several construction sites to observe workers on the job. Write a report of your findings, giving occupations that appear to be most interesting to you. Also, give reasons why these occupations seem to interest you the most. While at these sites, talk with the workers about

their work. Make a list of the tools, equipment, and building materials that are used in the work that interests you.

3. Acquire a blueprint and specifications for a building. Study the drawings and specifications as they relate to the occupations that interest you.
4. Practice using the tools that are used by workers in these occupations (hammer, rules, framing square, paint brushes, hand saw, trowels, levels, screwdrivers, sledge hammer, chalk line, etc.). Obtain tools and materials to make one or more projects that would be useful in the home. Do repair work around your home to get experience in the occupations you have selected to explore in depth. The following are some suggested activities: level a tool shed or some other small building; fix a leaking water pipe; mix mortar and build a 4 in. brick foundation wall around an existing building; repair the roof on a building; pour a concrete sidewalk slab; (Prepare the site for pouring.) using a brush, apply paint to a wooden surface; remove a broken window pane and install new glass; obtain some asbestos insulation and study its characteristics.
5. See one or more of the following films:
    a. The Construction Worker. Available from Modern Talking Picture Service, 214 South Cleveland Street, Memphis, Tennessee 38101.
    b. Careers In the Building Trades. Available from Coronet Instructional Films, 65 East South Water Street, Chicago, Illinois 60601.
    c. Painting and Decorating. Available from Curriculum Coordinating Unit, Drawer DX, State College, Mississippi 39762. 13 min.
    d. Plumbing. Available from Curriculum Coordinating Unit, Drawer DX, State College, Mississippi 39762. 14 min.
    e. Brick and Stone Mason. Available from Curriculum Coordinating Unit, Drawer DX, State College, Mississippi 39762.
    f. Operating Engineers (bulldozers, cranes, derricks, steamshovels). Available from National Special Media Institutes Inventory of Resourses, Michigan State University, East Lansing, Michigan 48823. 20 min. color.
6. Read the following book:
   Jobs In Building Construction. Available from Science Research Associates, Inc., 259 East Erie Street, Chicago, Illinois 60611.
7. Volunteer to work as a "helper" after school hours or on Saturday at a local construction site. It may be necessary to do clean-up and pick-up work, as many construction occupations are covered by the Child Labor Law and are classified as hazardous. Students under 14 years of age cannot work around such jobs.

ELECTRIC POWER AND TELEPHONE INDUSTRY

1. Study carefully the electrical system in your home. Write a report explaining the source of the electric power in your home, and how it is produced. The local power company can provide you with this information. Also, explain the purpose of a transformer used ahead of the wires entering your home, the purpose of a distribution panel, fuses, and circuit breaker in your home; and why the correct amount of electricity is normally present at light sockets and at wall outlets.

2. Acquire a basis electricity book and do the following activities:
   a. Strip the insulation from a short piece of electrical wire using wire strippers.
   b. Splice two short pieces of electrical cable using wire cutters, wire strippers, and a measuring tape.
   c. Acquire a construction plan and identify electrical symbols.
   d. Use a wire gage or micrometer to find gage and diameter for several sizes of wire.
   e. Write a two page report briefly explaining electromagnetism (the magnetic effects of a conductor carrying a current).
   f. Study Ohm's Law and work several problems using Ohm's Law. Get the assistance of the mathematics or science teacher if you cannot work these problems.
   g. Observe the watt hour meter that registers the consumption of electricity in your home. You will notice that it measures electricity in kilowatt hours. Identify the correct reading on the meter. Determine the basic operation of the meter.
   h. Ask the science teacher to show you how electric current, voltage, and resistance is measured by an electric meter.
   i. Take an old lamp socket and extension cord and attach the lamp socket to the extension cord making it safe for use as a source of light. Use the following procedure:
      (1) Disassemble the socket into its individual parts.
      (2) Strip the insulation from the end of the extension wire using wire strippers. Insert the wire through the base and cap lining.
      (3) Tie an underwriter's knot in the wire.
      (4) Fasten one end of each wire on a terminal on the base of the lamp socket.
      (5) Assemble. The shell should fit inside the case and snap into position.
3. Plan to observe a lineman, cable splicer, or groundman (telephone or electric power) working with utility lines in your town or out in the country. Write a report describing his work and the equipment, tools and supplies used in the work.
4. Plan to view one or more of the following films:
   a. The Electrical Worker. Available from Modern Talking Picture Service, 214 South Cleveland Street, Memphis, Tennessee 38104.
   b. The Telephone Man. Available from Modern Talking Picture Service, 214 South Cleveland Street, Memphis, Tennessee 38104.

MACHINING AND MACHINERY

1. Obtain several working drawings of machines, metal parts, and other objects. Borrow a mechanical drawing book from the mechanical drawing instructor, or check one out of the school library. Study the illustrations in the book. Use the book to determine the importance of a working drawing, and to determine what certain kinds of lines, signs, and abbreviations mean.
2. Go to the machine shop or agriculture shop and ask permission to tour the area. Look closely for the types of hand tools, measuring devices, and machine tools used in metal work. Hand tools used in metal work include machinist hammers, scribes, punches, files, pliers, wrenches, hack saws, snips, shears, etc. Measuring devices include gages, scales, calipers, micrometers, etc.

Machine tools include power hack saws, drill presses, milling machines, lathes, grinders, etc. Determine the purpose and use of each of these items in machine and machining work. You may gather this information by observing someone using the tools and equipment in a shop, or by reading a metal work or machine shop textbook.

3. Do several of the following operations in your school shop, using a metal work or machine shop textbook:
    a. Measure the length of a short piece of metal stock with a steel tape or rule.
    b. Measure the thickness of a thin piece of scrap metal with an outside micrometer.
    c. Cut a piece of scrap tin along a straight line using tin snips.
    d. Use hand wrenches to loosen and tighten bolts and nuts holding parts together.
    e. Attach a welding torch or a cutting torch to a regulator, using dual-type hose. Get your instructor, or the shop instructor to help prepare the welding machine for operation. Then try running a fusion bead using two pieces of scrap metal.
    f. Drill a hole through a flat piece of metal with a drill press. Use a vise to hold the metal stock firm.
    g. Use a file to cut rough edges from a piece of metal. Hold the metal in a vise.
    h. Bend a piece of sheet metal and thin metal stock into some desired shape.
    i. Do straight turning on a metal lathe.
4. Plan to see one or more of the following films:
    a. Precision Tool Making and Machining. Available from Modern Talking Picture Service, 214 South Cleveland Street, Memphis, Tennessee 38101.
    b. Jobs in Mechanical Work. Job Family Series No. 2. Science Research Associates, Inc., 259 East Erie Street, Chicago, Illinois 60611.
    c. Knowledge and Skills (story of Trade and Industrial Education). Association Films, Inc., 2221 Faulkner Road, Northeast, Atlanta, Georgia 30321.
    d. Futures In Welding. S.C.A. 1963 National Special Media Institutes Inventory of Resources, Michigan State University, East Lansing, Michigan 48823. 20 min. color.
5. Recording
   Mechanical Interest Occupations. Side 4. Record Series "Exploring the World of Work." Available from the Wilson Corporation 555 West 166th Street, South Holland, Illinois 60473.
6. Read one or more of the following publications:
    a. Opportunities In the Machine Shop Trades. Available from Vocational Guidance Manuals, 235 East Forty-fifth Street, New York, New York, 10017. Price $1.95.
    b. Aim For A Job In Welding by Thomas Berg. Available from Richards Rosen Press, Inc., 29 East 21st Street, New York, New York, 10010. Price $2.79.
    c. Careers In Automation. 1968 edition. Hawthorn Books, Inc., 70 Fifth Avenue, New York, New York 10011.

DATA PROCESSING

1. Go to a bank, hospital, school, business, industry, data processing center, or some other place that employs data processing personnel. Ask for permission to observe some of the data processing activity. Talk to those that are operating data processing equipment, or, are otherwise familiar with the equipment. Collect items (work samples) used in conjunction with data processing

equipment, such as punch cards and credit card statements. Make a poster, using these items to display in the classroom. Make a title for the poster, and give information about the items displayed.

2. Imagine that you are making a study at a local business and obtain information that is to be fed into a computer. (Do not include specific computer directions.) This may be information about customers, about billing the customers, about payrolls, inventories, etc. Get the business teacher to help plan the program of information.
3. Plan to see one of the following films:
   Your Future In Electronics. Available from Mr. C. E. Thomson, Registrar, 350 West 4th Street, New York, 14, New York. 21 min.
4. Read one of the following publications:
   a. Careers In Computer Programming. 1967 edition. Available from Henry Z. Walck, Inc., 19 Union Square West, New York, New York 10003. Price $3.75. 117 pages.
   b. Your Career In Computer Programming. Seligsohn, I. J. 1967 edition. Julian Messner, 1 West 39 Street, New York 10018. Price $3.95. 222 pages.
   c. Your Future In The Electronic Computer. Bibby, F. D. Available from Richards Rosen Press, Inc., 29 East 21st Street, New York, New York 10010. Price $2.79.

PRINTING AND RELATED OCCUPATIONS

1. Tour a newspaper office or some other printing shop. Make notes on the types of equipment used, and the function of each. Write a report on the field trip for presentation to the class.
2. Obtain and study a list of proofreader's marks. The business teacher can help in providing resource material such as a typewriting book. Such books will have proofreader's marks for study. Get a typewritten page and proof the copy, using the proofreader's marks to indicate mistakes.
3. Clip several small articles and pictures from a newspaper. Lay out and paste the pictures and articles on a standard sheet of notebook paper, making maximum use of the space available.
4. Plan to see the following film:
   What Greater Challenge (newspaper industry). 1963 Available from Copley Productions 434 Downer Place, Aurora, Illinois 60606. 10 min.
5. Read one or more of the following publications:
   a. Aim For A Job In Graphic Design/Art. Fujita, Neil. Available from Richards Rosen Press, Inc., 29 East 21st Street, New York, New York 10010. Price $3.78.
   b. Your Future In Printing. Reinfield, George Jr. Available from Richards Rosen Press, Inc., 29 East 21st Street, New York, New York 10010. Price $2.79.
   c. Opportunities In Technical Writing. Gould, Jay. 1964 ed. Available from Vocational Guidance Manuals, 235 East Forty-fifth Street, New York, New York 10017. Price $1.95 Paper bound, or $3.75 library edition.

RAILROADS

1. Study available information and write a report on the advantages and disadvantages of working for a railroad.

2. Plan to spend some time after school hours observing the many activities of those working at a railroad station, and those working with the trains. Interview the telephoner – telegrapher, or fireman. Locate and interview a conductor, carman, or engineer while one is off-duty. Also pick up a train schedule at the station. Study the schedule to determine departure locations and hours, terminations, etc.
3. Study available information and write a report on the history of the railroads, new jobs that were created, and new jobs that have recently been created as a result of new technological developments.
4. Read the following book:
   Your Career In Transportation. Liston, Robert. 1966 ed. Available from Julian Messner, 1 West 39th Street, New York, New York 10018. Price $3.95.

MECHANICS AND REPAIRMEN

1. Radio and television repairman: purchase a radio kit (AM and FM) to be assembled. These kits can be ordered from various companies complete with step-by-step instructions.
2. Change the oil and clean the air filter on your lawnmower engine. Your mower probably has instructions explaining the procedure.
3. Acquire a power mechanics book and do several of the following activities:
   a. Write a report on the history of power.
   b. Study your automobile and identify the fuel system, electrical system, cooling system, power train, suspension system, steering system, and braking system. Write a report briefly explaining the function of each.
   c. Write a report briefly explaining the difference between a diesel engine and your automobile engine. Also, relate the importance of diesel engines in transportation.
   d. Write a report on the tools and equipment used by power mechanics in service and repair work.
   e. Write a report explaining the types of aircraft engines, and the types of engines and propulsion systems used in space flights.
4. Obtain a basic electricity book and do the following activities:
   a. Write a report explaining the use of electricity in an air conditioning system, refrigerator, electric range, electric hot water heater, and electric iron.
   b. Write a report briefly explaining the meaning of positive and negative charges of electricity, electromagnetism, Ohm's Law, electrons, atoms, electronics, and circuits.
   c. Make a list of hand tools used in electrical work.
5. Refer to activity group No. 4 under Machining and Machinery Occupations and do several activities.
6. Plan to see one or more of the following films:
   a. The Electrical Worker. Available from Modern Talking Picture Service, 214 South Cleveland Street, Memphis, Tennessee 38101.
   b. The Motor Mechanic. Available from Modern Talking Picture Service, cited.
   c. The Electronic Technician. Modern Talking Picture Service, cited. 29 min.
   d. Your Future In Electronics. Available from Mr. C. E. Thomson, Registrar, R C A Institute, Inc., 350 West 4th Street, New York, 14, New York. 21 min.

7. Read one of the following books:
    - a. Your Career In Electronics. Neal, Harry E. 1963 edition. Available from Julian Messner, 1 West 39 Street, New York, New York 10018. Price $3.64. 191 pages.
    - b. Your Career In Television and Radio. Gordon, George, and Irving A. Falk. 1966 edition. Available from Julian Messner, 1 West 39 Street, New York, New York 10018.
    - c. Aim For a Job In Air Conditioning and Refrigeration. Daly, Donald F. Available from Richard Rosen Press, Inc., 29 East 21st Street, New York, New York 10010 Price $3.78.
    - d. Aim For A Job In Automotive Service. Taylor, Dawson, and James Bradley. Available from Richard Rosen Press, Inc., 29 East 21st Street, New York, New York 10010. Price $3.78.
    - e. Aim For A Job In Watchmaking. Lipton, Benjamin J. Available from Richard Rosen Press, Inc., 29 East 21st Street, New York, New York 10010. Price $3.78.
    - f. Your Future In the Automotive Industry. Taylor, Dawson. Available from Richard Rosen Press, Inc., 29 East 21st Street New York, New York 10010. Price $2.79.

ENGINEERING AND ENGINEERING TECHNICIANS

1. Read one of the following books:
    - a. Boyd, Waldo T. Your Career In the Aerospace Industry. Available from Julian Messner, 1 West 39th Street, New York, New York. 10018. Price $3.94. 224 pages.
    - b. Neal, Harry E. Engineers Unlimited. 1968. Available from Julian Messner, 1 West 39 Street, New York, New York 10018. Price $3.95. 192 pages.
    - c. Shackleton, Paul S. Opportunities in Electrical and Electronic Engineering. Available from Vocational Guidance Manuals, 235 E. 45th Street, New York, New York 10017. Price $1.95 paperbound, $3.95 library edition.
    - d. Scholes, Samuel Ray. Opportunities in Ceramic Engineering. Available from Vocational Guidance Manuals, 235 E. 45th Street, New York, New York 10017. Price $1.95 paperbound, $3.95 library edition.
    - e. Stone, Archie A. Opportunities in Agricultural Engineering. Available from Vocational Guidance Manuals, 235 E. 45th Street, New York, New York 10017. Price $1.95 paperbound, $3.95 library edition.
2. Arrange to see one of the following films:
    - a. Engineer: Man of Destiny. Available from National Special Media Institute Inventory of Resources, Michigan State University, East Lansing, Michigan 48823. 20 min. (color.)
    - b. Careers In Engineering. Available from National Special Media Institute Inventory of Resources, Michigan State University, East Lansing, Michigan 58823. 15 min. (color.)
3. Aerospace engineer, engineer technician
    - a. Use your imagination to design a new type of aircraft or spacecraft. Draw a picture of the craft on paper and make a model with metal or wood. Write a report explaining the structure, instruments to be used, propulsion system, materials that would be used to build the craft, how it would be manufactured, and how it would be tested.
    - b. Acquire an engineering materials book from the school library or the science department. Write a four-page report giving the following information: (1) definition of nonferrous metals and alloys, (2) desirable qualities of nonferrous metals and alloys, (3) uses of nonferrous

metals and alloys in the aircraft and space industry (particularly aluminum and aluminum alloys, titanium and titanium alloys), and (4) the mechanical and physical properties of aluminum and titanium.

- c. Arrange to interview an aerospace engineer at an aircraft and parts industry, at a commercial airline terminal, or at a college or university that has an aerospace engineering department.
- d. Write the following source for additional information: American Institute of Aeronautics and Astronautics, Inc., 2 East 64th Street, New York, New York 10021.

4. Agricultural Engineer
   - a. Use your imagination to design a new type farm equipment, machinery, or structure. Draw a picture of the design on paper, or make a model from wood or metal. Write a report explaining the use of the item, how it varies from other similar items, materials necessary to manufacture the item, how it would be manufactured, and what testing, if any, will need to be done before it will be put to practical use.
   - b. Develop basic plans for building a dairy barn, using the most modern equipment and work area arrangements. Consult your teacher about using part of the plan in practical application on your farm, or some one else's farm.
5. Chemical Engineer, Ceramic Engineer
   - a. Talk with the chemistry teacher or other science teachers about doing the following activities in the science laboratory:
     - (1) Set up apparatus and test several materials (ores, minerals, gases, etc.) for the presence of elements and substances.
     - (2) Write a two-page report of common hazards in a chemistry laboratory. Include a plan to minimize such hazards, including equipment and apparatus alterations.
   - b. Ask the science teacher to explain what high school courses are essential for those seeking careers in chemical engineering or ceramic engineering. Ask the science teacher to explain the nature of the work done by technicians in these two fields.
6. Civil Engineer
   - a. Visit a local water and wastewater treatment plant to observe water and wastewater technicians and engineers on the job. This may be done in the field or in a laboratory. Write a report on several aspects of your findings, such as how they test for water purification, how water is purified, and methods used to analyze waste water (sewage). Summarize how the city water (for household use) is stored and made available to the consumer (distribution design).
   - b. Acquire a mechanical drawing book that has a chapter on topographical drawing. (Consult your mechanical drawing or drafting instructor.) Study the symbols for works of man, elevations and depressions, and vegetation. Develop a topographical drawing of your school, and the immediate property and roads surrounding the building.
   - c. Work the following problem: In a cement mix, the amount of sand (by volume) is twice the amount. The amount of gravel is 40 cubic yards more than three times the amount of cement. If 7360 cubic yards of cement is mixed, how much of each of the three components is used? (Consult your mathematics teacher if you have trouble working this problem.)
7. Mechanical Engineer
   - a. Consult your mechanical drawing instructor or drafting instructor to do the following activities: Acquire a mechanical drawing book. Study the various drafting instruments, materials, and equipment used in drawing. Obtain a set of drafting instruments and try your hand at

some geometric constructions involving straight lines, angles, arcs, tangents, and ellipses. Finally, sketch a simple - complex object in orthographic projection (three views).

   b. Study a jig or fixture, or a die that is used in the machine shop. Try your hand at redesigning the object for greater ease and economy in manufacturing. Make sketches with all necessary dimensions.
   c. Study the heating system in your home. Write a 4-page report giving the following facts: energy source (gas, electricity, etc.); mechanical components (motors, compressors, blowers, etc.); controls (thermostatic, pneumatic, etc.); and the heating and cooling capacity of the unit(s) in Btu. Explain the function of each component and the controls.
   d. Study the engine of your automobile. Write a 3-page report giving the major components of the automobile and tell briefly what each component does and how it works.

8. Mining engineer
   a. Use a library resource book to write a three-page report on the following:
      (1) Types of minerals that are mined.
      (2) How minerals differ from natural resources (forests, water, etc.).
      (3) How minerals are mined, including constructing the facilities (mining engineer role), and the equipment and tools used.
      (4) Types of mines.
   b. Make a study of your county to see if any mining is being conducted. Typical minerals that are mined in the South are phosphate rock used in fertilizers; limestone rock used in cement, lime, and iron; salt, and gravel; iron ores; and coal. Visit a mining site to see the operation.
   c. Find out the value of various minerals, and what methods and equipment are used to detect and locate minerals. Talk with geologist, geophysicist, geochemist, or a mining engineer about their roles in mining. Find out how much of a particular mineral must be present to be economically feasable to mine.

APPAREL INDUSTRY

1. Visit a home economics class and ask someone to demonstrate the operation and uses of a sewing machine.
2. Use a small pattern and place it on a piece of scrap cloth. Cut out the pattern. Use the material to practice sewing on a machine.
3. Visit the local apparel industry. Observe the procedures for construction of a garment. Write a report for presentation to the class.
4. Inspect the construction of some of the clothes you have at home. Notice the quality of the construction, and the type and quality of the material.

FOUNDRY

1. Acquire a machine shop or metal work book that has a chapter on the foundry. Write a three-page report on the processes of the foundry. Emphasize the duties of the patternmaker, molder, and coremaker.

2. Use a mechanical drawing book. Study the chapter on machine drawing relative to the drawing specifications used by those who work in the foundry.

BAKER

1. Bake a cake (without the use of a cake mix). Apply frosting and decorate the cake.
2. Bake cupcakes at home and bring them to the class the next day. Let the students judge the flavor, and comment on the appearance of the cakes.
3. Arrange to go the school cafeteria to observe quantity baking.

JEWELRY

1. Take several items of jewelry from home and make a display. Use velvet, wool, or satin as props.
2. Study the characteristics of several types of jewelry. Study jewelry illustrated in a catalog. Look for such information as jewelry types, characteristics of the metals, and jewelry size.
3. Try making a piece of jewelry from scrap metals, or from old jewelry pieces.

DRAFTSMEN

1. Use a mechanical drawing book as a reference and sketch a tangible object in orthagraphic projections (three views). Show holes, hidden lines, and dimensions.
2. Use a floor plan from a magazine and redraw the plan to scale. Use an architect's scale and the correct shade pencil to do a good job. You may wish to change the original plan by adding or deleting.
3. Draw the floor plan of your home to scale. Show the shubbery, grass areas, streets, etc., that surround your home.
4. Practice doing some architectural-style lettering. Refer to a mechanical drawing book to see some of the various styles. Draftsmen eventually develop their own style.
5. Read the following material:
   Opportunities In a Drafting Career by Benjamin J. Stern. 1967 edition. Available from Vocational Guidance Manuals, 235 East Forty-fifth Street, New York, New York 10017. Price $1.95 paperbound, $3.75 library edition.

EVALUATION

Some student and teacher evaluation tools have been suggested during this unit. There should be a culminating evaluation at this point to determine (1) the behavior changes produced by the presentation of the general information to the group and (2) the behavior changes occurring from individual exploration of specific occupations.

See appendix C for a sample evaluation questionaire.

EDUCATIONAL PLANNING

Students have had an opportunity to look closely at their fitness for one or more occupations in the technology category. However, all these occupations require some preparation before the prospective worker is ready to assume his duties.

This preparation includes both general education and specialized training. The sewing machine operator, meter reader, and concrete paver may not need to prepare beyond high school, except for a brief period of demonstration and practice on the job. The engineer and airline dispatcher are required to have a college degree, and may do post-graduate work in order to be prepared. Many technology jobs require continuous training as a result of new developments and research.

Discuss the relationship between certain high school courses and college entrance requirements. Point out licensing and certification requirements for certain technology occupations.

Reemphasize the need for completing high school and for doing additional training after high school.

Review minimum educational requirements for certain occupations. Explain the changes taking place in these requirements.

Select three or more occupations in the technology category requiring different types of educational preparation, and trace the education and training needed from the beginning of high school until employment. Secure catalogs from each of the public and private junior colleges in the state. Determine which colleges offer programs leading directly to employment in technology occupations after successfully completing the prescribed courses (ie, nursing, police science, fireman, or food service). Provide the students with this information.

Secure catalogs from each of the four-year colleges and universities in Mississippi. Determine which institutions offer preparation for technology occupations.

Let each class member investigate the kind of education and training needed for the occupation(s) he has tentatively chosen. Determine the time necessary for preparation and the cost of such preparation.

Point out the other type institutions that offer training for technology occupations (e.g. business schools, technical institutions).

Point out where students might get on-the-job training and training through apprenticeship immediately after high school.

Get a complete listing of course offerings in your school. Learn how English, mathematics, science, and other subjects contribute to the development of skills needed in technology occupations. Determine what courses are required of all students and why. Find out what elective courses are offered, and which ones would be beneficial in planning for technology occupations.

Find out what courses offered in your school would lead directly to employment after high school. Make arrangements to discuss with the teachers how these courses would help in preparing for technology occupations.

UNIT 6
OUTDOOR CATEGORY

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
State College, Mississippi

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OUTDOOR CATEGORY

TEACHER OBJECTIVES:

1. To define the outdoor occupational category.
2. To acquaint pupils with occupations in the outdoor category.
3. To acquaint pupils with the education needed for entry and advancement in the outdoor category.
4. To acquaint pupils with the trend in occupations in the outdoor category.
5. To show pupils how the subjects they are now taking in school relate to outdoor category occupations.
6. To provide the opportunity for pupils to make a detailed study of one or more occupations in the outdoor category.
7. To provide pupils with realistic experiences that pertain to outdoor occupations.

STUDENT OBJECTIVES:

1. To be able to intelligently discuss with peers the occupations included in the outdoor category.
2. To be able to weigh one's personal traits with the traits required by persons in the outdoor category occupations.
3. To be able to select an educational program that will prepare one for entry into outdoor category occupation(s).

QUESTIONS RELATING TO THIS CATEGORY:

1. What is an outdoor occupation?
2. What are the occupations in the outdoor category?
3. What is the significance (scope) of occupations in the outdoor category?
4. What is the nature of the work in outdoor occupations?
5. Where is employment in outdoor occupations found?
6. What education is needed for entry and advancement in outdoor occupations?
7. What are the earnings and fringe benefits of outdoor occupations?
8. What is the employment outlook for occupations in the outdoor category?
9. What is the relationship between subjects taken in school to outdoor occupations?

WHAT IS AN OUTDOOR OCCUPATION?

An outdoor occupation is one in which part or all of the working hours are spent outside of the confines of a building. The occupations are primarily concerned with mining, forestry, production agriculture, fishing, and activities of similar nature.

WHAT ARE THE OCCUPATIONS IN THE OUTDOOR CATEGORY?

The occupations in the outdoor category are listed below with a brief summary of what each involves. They are grouped according to petroleum, surveying, and other outdoor occupations. The occupations also are placed in groups as in the other categories.

GROUP I

No occupations

PETROLEUM OCCUPATIONS

GROUP II

Petroleum engineer-supervises the overall planning and drilling of oil wells.

GROUP III

A. Computer seismograph crew - analyzes the statistics obtained from seismograph exploration, such as computing how deep a strata of rock is located beneath the surface of the earth.

B. Petroleum scout - determines and informs the company which has employed him regarding oil exploration, leasing, drilling, and production in an assigned area.

GROUP IV

A. Cable-tool driller - controls the operations of an oil drilling rig and keeps accurate records of the drilling activity.

B. Petroleum cementer - operates machine which mixes and pumps cement into the space between steel casings and side walls of oil wells to prevent cave-ins.

C. Petroleum draftsman - drafts plans for laying out oil fields, refineries, and pipe-line systems.

D. Petroleum gager - keeps records of the amount of oil flowing into tanks or through pipes.

E. Seismograph crew observer - maintains and operates seismograph equipment.

F. Plane table operator - prepares and revises maps based on the data gathered by means of plane table and alidade.

G. Shooter - places and detonates explosive devices used in seismograph exploration.

GROUP V

A. Acidizer - forces acid into the bottom of an oil well to increase the flow of oil.

B. Cable-tool dresser - assists an oil well driller and maintains the drilling equipment.

C. Derrickman - works on a small platform high upon an oil drilling rig.

D. Engineman - operates motors and engines which supply power to operate an oil drilling rig.

E. Perforator operator - places and detonates explosives in drill pipes, casings, and tubing to make passages through which oil can flow.

F. Prospecting driller - operates portable drilling rigs used in seismograph operations.

G. Pumper - maintains and operates pumps used in moving oil.

H. Rotary driller - operates oil well drilling machine which controls pressure and speed of drill, and is in charge of drilling crew.

I. Sample-taker operator - obtains samples of silt and rock to help geologists determine if oil is present.

J. Treater - analyzes crude oil for the presence of water and sediment.

GROUP VI

A. Fireman - works at oil rigs which use steam for power.

B. Prospecting drill helper - assists prospecting drillers.

C. Pumper helper - assists pumpers in maintaining and operating pumps and motors.

D. Rig builder - installs drilling rigs.

E. Roughneck - assists rotary floormen who guide the lower end of pipe to and from the well opening, and connects and disconnects drill bits and pipe joints on an oil rig.

F. Roustabout - general oil field laborer who does odd jobs.

G. Well puller - removes pipes and casings from oil wells for cleaning, repairing, or salvaging.

SURVEYING OCCUPATIONS

GROUP II

A. Chief surveyor - head of survey party who is responsible for the accuracy of survey work.

B. Geodetic surveyor - measures large land, sea, or space areas, taking into consideration the curvature of the earth and geophysical conditions.

C. Hydrograph surveyor - makes surveys of harbors, rivers, and other bodies of water.

D. Topograph surveyor - conducts surveys to determine elevations, depressions, and contours of the earth.

E. Photogram surveyor - applies mathematical techniques to photographs of the earth's surface to measure natural and manmade features of an area.

GROUP III

A. Highway surveyor - establishes points, grades, and lines needed in the construction of highways.

B. Land surveyor - locates and plots boundaries of land.

GROUP IV

A. Chainman - measures the distances between points using a surveyor's chain or tape.

B. Instrument man - sets up and adjusts survey equipment.

GROUP V

Rodman - carries and reads the rod used in surveying elevations, distances, and directions.

OTHER OUTDOOR OCCUPATIONS

GROUP II

A. Landscape architect - plans and designs parks, lawns, and shrubbery surrounding industries, schools, homes, and highway beautification projects.

B. Range manager - conducts research into problems concerning the production of forage for livestock.

GROUP III

Forester - manages and develops forest lands.

GROUP IV

Forestry technician - assists foresters in managing and caring for forest lands.

WHAT IS THE SIGNIFICANCE (SCOPE) OF OCCUPATIONS IN THE OUTDOOR CATEGORY?

The occupations in the outdoor category are very important in the nation's economy. Outdoor occupations include those that are concerned with the production of food, fiber, forestry products, and petroleum and natural gas. The well-being of all mankind depends upon these occupations. The affluent life in America must be attributed to a productive agriculture. One person engaged in production agriculture produces sufficient food or fiber to meet the needs of more than forty people. Currently there are slightly less than five million persons employed in production agriculture in the United States. Also to be noted are the agricultural occupations other than production agriculture. There are two persons employed in agricultural occupations off the farm for every one person employed in agriculture on the farm.

Much of the power used in manufacturing plants and in transportation is produced by petroleum and natural gas industries. In fact, about three-fourths of all energy fuels used in America is supplied by petroleum. A large portion of the heat for homes, schools, and factories comes from petroleum or natural gas. A large number of synthetic products also are made from petroleum, including certain fertilizers, plastics, and synthetic rubber products. Almost one-half million persons are employed in the petroleum industry in the United States. These persons are involved in exploration and drilling operations, in refineries, and in various types of processing plants. The number of persons employed in producing natural gas and petroleum is close to 280,000.

The other occupations in the outdoor category do not have nearly as many employees as do the petroleum and agricultural industries. There are only about 5,000 landscape architects in the United States. A larger number of people (estimated to be 23,000) are employed as foresters. The largest group in the outdoor category, except in petroleum and agricultural production, is in surveying. The number of surveyors is very nearly 45,000. Several thousand assistants, known as rodmen and chainmen, aid surveyors in their work.

WHAT IS THE NATURE OF THE WORK IN OUTDOOR OCCUPATIONS?

The chief characteristic which distinguishes the occupations in this category from those in the other categories is that most of the work is done outdoors. That is, only a small portion of the working hours are usually spent inside buildings.

Production agriculture occupations, commonly known as farming and ranching occupations, are primarily outdoor jobs. The persons employed in such occupations are usually concerned with the growth of either plants or animals or both. The work may consist of operating large tractors which till the earth's surface or with rounding up a herd of cattle for vaccination. Farming has become a scientific venture in which considerable knowledge of mechanics, chemicals, and biology is necessary. Laborious hand work has largely been replaced by machines. The conditions of work may be hot and dusty or cold and snowy. Animals must be cared for even in the most undesirable weather. The hours of work may be long but are not nearly as long as they were a few years ago. Persons employed in outdoor production agriculture occupations enjoy many of the same comforts as persons employed in other occupations.

Much of the work in the petroleum occupations included in the outdoor category requires physically capable men who can put in long hours of rugged activities. Drilling rigs must be erected and, once erected, they usually are operated twenty-four hours per day. Access roads must be constructed to the drilling-rig sites. Supplies must be transported to the sites. Wells once they are drilled, must also be maintained if they are productive. The working conditions in occupations in the petroleum and natural gas industries may be hot and dusty or on rigs located out in oceans and lakes. A worker may become covered with dust and grease while on the job. Workers with drilling or construction crews also frequently must travel many miles from home for several days or weeks at a time.

Landscape architects plan and supervise the establishment of parks, highways, housing projects, school grounds, and residential areas. Their specific activities are concerned with the establishment of scenic areas. Much time may be spent studying a site to determine its features and what sort of grading and planting would most enhance its beauty. Plans are drawn showing how buildings, roads, walks, trees, terraces, shrubs, and other features can be arranged for the greatest beauty and enjoyment.

Surveyors determine the locations and measurements of contours, elevations, points, and lines on the earth's surface. Various types of survey instruments may be used. Instrumentmen, chainmen, and rodmen assist the surveyor in his work. Readings are taken using a survey instrument and rod, or other instruments. The readings are recorded and used in calculating the desired information. Surveyors work under conditions varying from very hot to cold and from dusty to muddy. Occasionally surveyors work in dense forests where mosquitoes and other annoying insects are present. Briers and poisonous vines also may be found in their work environment. Frequently members of a survey party must chop their way through weeds and brush.

The forestry occupations in the outdoor category are concerned with managing, developing, protecting, and harvesting forest lands. Foresters spend much time walking through forests studying and measuring trees, calculating the amount of salable timber present, marking the trees to be cut, inspecting for damage by insects and diseases, and preventing and controlling forest fires. The work is strenuous and often requires persons who are physically fit to walk long distances and to use axe and saw. The conditions of the work may be very hot or cold. A forester may get caught without shelter in a rain or snow storm. A forester may come into contact with many kinds of insects and poisonous plants. Also, foresters must frequently possess the skill to operate various kinds of power equipment, such as saws, tractors, sprayers, and tree planters.

WHERE IS EMPLOYMENT IN OUTDOOR OCCUPATIONS FOUND?

Employment in production agriculture occupations is found in all states of the United States. However, many more are employed in some states than in others. Many production agriculture occupations are found in Mississippi. Of course, these occupations are found in the rural areas rather than in the cities.

Petroleum and natural gas occupations are found in a number of states; however, almost 90 percent of the workers are found in ten states which produce the most petroleum and natural gas. Texas has the largest number of such occupations; Mississippi is included among the top ten states. A number of American workers are employed in foreign countries by oil companies with holdings outside the United States.

Surveyors are employed in all parts of the country. Almost one-half of them (22,500) are employed by government agencies at either the local, state, or federal level. The remaining surveyors are either employed by construction companies or operate their own surveying business.

Foresters are employed by the government or by private industry. Nearly 8,000 are employed by the Forest Service in the Department of Agriculture. Foresters are also employed by colleges and universities involved in teaching and research. A great number of persons are employed to assist foresters in their work. Most forestry occupations will obviously be found where forests and forestry is very important.

Forestry and forestry products are very important in Mississippi; therefore, a large number of people are employed in forestry occupation.

WHAT EDUCATION IS NEEDED FOR ENTRY AND ADVANCEMENT IN OUTDOOR OCCUPATIONS?

The amount of education necessary for entering occupations in the outdoor interest category varies considerably. Avancement is based upon education and productivity while on the job. It is not necessary to have a high school diploma for low-paying, menial, outdoor jobs. Other jobs require advanced degrees. Many require high school or vocational school diplomas. Surveyors, foresters, and other professional occupations, require at least a bachelor's degree. Most outdoor occupations in the petroleum and natural gas industries require only a high school diploma. An inexperienced worker frequently receives on-the-job training under the supervision of an experienced foreman or supervisor. On-the-job experience is required for advancement in most of the outdoor occupations.

WHAT ARE THE EARNINGS AND FRINGE BENEFITS IN OUTDOOR OCCUPATIONS?

Earnings in outdoor occupations vary considerably. Earnings from occupations in production agricultrue vary with size of the farm, kinds of crops or livestock produced, demand and supply for the crops or livestock produced, and the general price structure. It is logical that managers of large farms would earn more money than managers of smaller farms. The same frequently is true with the other occupations found on farms. Earnings also may vary with the yield of the crops or livestock produced. Earnings usually are greater when a large crop is produced due to favorable weather and other conditions. Years in which crop productivity is low also indicate that income is lower than in other years. Of course, the income from some production agriculture occupations is not based upon production. The people in these occupations receive the same amount of pay regardless of crop production. Fringe benefits in production agriculture occupations frequently include rent free housing, free utilities, and other benefits. There also may be considerable free time during the winter months.

Occupations in the petroleum and natural gas industries frequently pay well when compared with other outdoor occupations. Earnings in 1967 usually ranged from two to four or more dollars per hour. Workers averaged slightly more than forty hours per week. Fringe benefits frequently include paid vacation and sick leave. Workers on the late night shift may receive 10 to 20 cents per hour more for their work.

Occupations in survey work (surveyors and their assistants) pay on the bases of education, experience, and degree of responsibility. Survey party chiefs usually receive between $6,500 and $9,000 per year. Starting salary frequently is a little less. Assistants, such as rodmen and chainmen, do not receive as much pay - frequently minimum wages or only slightly above.

Pay in forestry occupations varies considerably. Foresters with college degree start at an annual salary of around $6,000 to $7,000. District rangers employed by the government earn $9,000 or more per year. Forestry aids and technicians receive from $4,000 to $7,500 a year. Occasionally, foresters may be furnished rent free housing. Paid vacations and sick leave are included in the fringe benefits.

WHAT IS THE EMPLOYMENT OUTLOOK FOR OCCUPATIONS IN THE OUTDOOR INTEREST CATEGORY?

The number of persons employed in production agriculture has been declining in recent years. Such a trend does not mean that farming is declining in importance, but that machinery and technology are replacing human work. This trend indicates that fewer persons are needed but that these persons must be well educated and possess a high degree of skill.

Employment in the petroleum and natural gas industries has been gradually declining in recent years. This is primarily due to increased mechanization. Most of the opportunities that will be available will result from the death or retirement of present workers.

The employment opportunities in the surveying occupations are expected to be good during the next few years. The rapid development of cities and highways will demand a large number of surveyors, instrumentmen, rodmen, and chainmen.

Employment in certain forestry occupations is expected to increase during the next few years. As the population grows so does the demand for forestry products, such as paper and lumber. The increased demand for persons with college degrees in forestry will be in both industry and government. The number of persons employed in certain occupations involving forest production will decline due to increased mechanization. More highly skilled persons will be required to operate the machinery used in forest production.

WHAT IS THE RELATIONSHIP BETWEEN SUBJECTS TAKEN IN SCHOOL TO OUTDOOR INTEREST OCCUPATIONS?

It is always important to take courses in school that will be beneficial in future occupations. For the agricultural occupations of the outdoor category, courses in agriculture are beneficial. Many schools offer three or more years of agriculture in the high school grades. Persons contemplating any agricultural occupation, such as in forestry, ornamental horticulture, or mechanics, should take agricultural courses if they are available. Courses in biology and general science also are helpful. Persons contemplating careers in surveying should take as many mathematics courses, especially geometry, as possible in high school. Courses in English and communications are extremely valuable in all occupations, especially for advancement.

SUGGESTED ACTIVITIES FOR STUDENTS

Select one or more specific occupations in the outdoor category in which you are interested. Make a detailed study of the occupation(s) selected by using pamphlets, bulletins, books, occupational briefs, and other materials. Attempt to determine the following for each occupation which you selected:

A. What does the occupation involve? Do I like it?
B. What kind of work do people employed in the occupation do? Do I like it?
C. Where is employment in the occupation found? Would I be willing to go there to work?
D. What is the salary for the occupation? Do I find this amount acceptable?
E. What education and training are required for entering the occupation? Do I want to get this education and training?
F. Where are the required education and training obtained? Do I want to go there to get them?
G. How long will it take to get the necessary education and training? Do I want to go to school that long?

Select and conduct one or more of the following activities:

I. Agricultural occupations - (occupations which require some knowledge of agricultural subjects)
  A. Production agriculture
    1. Visit and tour a nearby farm. Interview the operator or manager to become familiar with the nature of production agriculture.
       Ask the following questions:
       a. What are the main sources of income on the farm? (specific crops and livestock)
       b. How many people work on the farm? How are they paid (hourly, daily, monthly, a share of production, etc.)?
       c. What are the main problems facing this farm?
       d. What kind of machinery and equipment is used?
    2. View one or more of the following motion pictures:
       a. Providers of Plenty
       b. Life on the Modern Farm
       c. Mississippi Agriculture
       d. Vocations in Agriculture
       e. Poultry Raising
       f. The Dairy Industry
       (All of the above films are available on short term loan from Curriculum Coordinating Unit, Motion Picture Library, P. O. Drawer DX, State College, Mississippi 39762.)
  B. Agricultural Mechanics
    1. Make a tour of the agricultural mechanics shop in your high school. Determine the kind of instruction given and the nature of the activities performed in the shop.
    2. Visit the agricultural mechanics shop in your school. Perform the following activities:
       a. Weld two pieces of metal together with an arc welding machine.
       b. Service the air cleaner on a tractor.
       c. Service the battery in a tractor.
       d. Pack the front wheel bearings on a tractor.
    3. Visit a farm or other agricultural business and observe the operation of agricultural machinery. Note the skills required to operate and maintain the machinery.
    4. Visit a local agricultural equipment dealer. Make a tour of the facilities and observe the employees at work.

5. View the following film:
   Agricultural Engineering, Profession With A Future. (Available on short term loan from Curriculum Coordinating Unit, Motion Picture Library, P. O. Drawer DX, State College, Mississippi 39762)

C. Ornamental horticulture (including landscape architecture)
   1. Visit a nearby nursery or flower shop. Arrange for the manager to provide a tour of the facilities.
   2. Graft a pecan stock with a selected scion. Consult horticultural books for when and how to do it.
   3. Make a plot plan of your home and the lawn surrounding it, identifying all trees, shrubs and flowers. Study the plan. Consult references on landscaping to determine how the landscape design can be improved.
   4. Plant tomato seed in a flat in a greenhouse, climatorium, or on the window sill. When the plants have reached the proper size, transplant to peat pots or cut-off milk cartons. Transplant to a garden when five to eight inches high.
   5. Plan and conduct a beautification project on the school grounds.

D. Agricultural supplies
   1. Visit a nearby feed, seed, or fertilizer store. Attempt to determine the answers to the following questions:
      a. What kinds of supplies are sold?
      b. Are any of the products dangerous?
      c. What is the nature of the work?
      d. What kinds of questions do customers ask?

E. Agricultural products
   1. Visit a cotton gin during the fall months when it is operating. Note the processes involved in ginning the cotton and the mechanical operations of the ginning equipment.
   2. Visit a nearby livestock auction. Observe how the cattle are penned, tagged, auctioned, and weighed.
   3. Visit a nearby vegetable packing shed or collection point. Identify the kinds of vegetables being handled. Observe how the vegetables are transported, weighed, graded, and stored.

F. Forestry
   1. Invite a forester to visit class and discuss the occupations in forestry.
   2. Visit a nearby fire tower. Talk to the person on duty concerning the nature of his work.
   3. Make a trip to a forest that is being harvested. Note how the trees are cut, measured, loaded, and hauled. Identify the kinds of trees being harvested. Talk to one of the workers about the kind of work involved.
   4. View one or more of the following films:
      a. The Paper Forest
      b. From Trees to Paper
      c. The Forest Produces
      d. The Forest Grows
      e. From Trees to Lumber
      f. Forests and Conservation

g. It's No Picnic
h. It's a Tree Country
(All of the above films are available on short term loan from the Curriculum Coordinating Unit for Vocational and Technical Education, Motion Picture Library, P. O. Drawer DX, State College, Mississippi 39762.)

II. Petroleum Occupations
  A. Arrange to visit a nearby oil well drilling rig. Observe the operation of the rig. If possible, talk to the driller about the drilling procedure and the problems encountered in drilling a well.
  B. Contact an oil refinery and arrange for a field trip. Tour the facilities of the refinery. Note the different occupations and the nature of the work in each occupation. Talk to some of the people who work there.
  C. Arrange for a visit with a seismograph crew while at work. Talk to members of the crew about the work they are doing.

III. Surveying occupations
  A. Contact a local surveyor and arrange for him to visit class and discuss his occupation. Also, it would be well for him to bring his survey instruments and demonstrate their use to the class.
  B. Spend a day with a survey party. Note the nature of the work of each member of the party. Observe how the instruments are read.
  C. Attempt to write a description of the land on which your home is located. The description should include the range, section, and township. Consult a deed to the property or the chancery clerk in your county for help in writing the description and in checking for accuracy.

UNIT 7
SCIENCE CATEGORY

PRELIMINARY DRAFT

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SCIENCE CATEGORY

OBJECTIVES

TEACHER OBJECTIVES:

1. To define the science category.
2. To acquaint pupils with occupations in the science category.
3. To acquaint pupils with the educational requirements for entry and advancement in occupations in the science category.
4. To acquaint pupils with the trend in occupations in the science category.
5. To show pupils how the subjects they are now taking relate to science category occupations.
6. To provide the opportunity for pupils to make a detailed study of one or more occupations in the science category.
7. To provide pupils with realistic experiences pertaining to science occupations.

PUPIL OBJECTIVES:

1. To be able to intelligently discuss with peers the occupations included in the science category.
2. To be able to weigh one's personal traits with the traits required of persons in science category occupations.
3. To be able to select an educational program which will prepare one for entry into science category occupation(s).

QUESTIONS TO BE ANSWERED

What is science?
What are the kinds of science?
What are the occupations in the science interest category?
What is the significance(scope) of occupations involving science?
What are the characteristics of the occupations in biological science?
What are the characteristics of the occupations in earth science?
What are the characteristics of the occupations in physical science?
What are the characteristics of the occupations in mathematics?
What are the characteristics of the occupations in social science which are included in the science interest category?

I. WHAT IS SCIENCE? WHAT ARE THE KINDS OF SCIENCE?

Science includes many things. In its broad sense, it is the knowledge of principles or facts. The part of the knowledge which relates to the physical world around us is known as **natural science.** That which is concerned with all aspects of human society is **social science.** It is very easy to make the basic distinction between natural and social sciences. Natural science is concerned with plants, animals, the earth, and the forces that act upon each of these. Mathematics is also frequently included as a natural science. Social science is the study of man from his origin to an analysis of his current behavior, including how the society functions. Social science includes economics, sociology, politics, civics, and other sciences.

The science category is primarily concerned with occupations (in which the people are interested) in natural science. A few of the occupations included here are in the social sciences. However, it must be noted that many of the people employed in natural science occupations must also have knowledge and skill in social science.

NATURAL SCIENCE

Natural science is commonly divided into four broad groups – **biological** science, **earth** science, **physical** science, and **mathematics.**

BIOLOGICAL SCIENCE

The biological science group (commonly called **biology**) is also known as life science since it is concerned with all living things – plants and animals. The phase of biology dealing with plants is known as **botany**, whereas that dealing with animals is known as **zoology**.

EARTH SCIENCE

Earth science can be easily distinguished from biological science. Earth science does not include living plants or animals even though plants and animals are dependent upon the earth for sustenance. Earth science is concerned with the history of the earth; the composition of the earth's crust, interior, and atmosphere; and the characteristics of its parts. Earth science is subdivided into groups based upon the part of the earth being studied. Among these are **geology**, **geophysics**, **meteorology**, and **oceanography**. Geology is concerned with the structure, composition, and history of the earth's crust , including rocks, minerals, and fossils. Geophysics is a broad overlapping term which includes the study of the earth's size, shape, atmosphere, and bodies of land and water. Highly complex scientific instruments are used to do much of the study. Meteorology involves the study of the earth's atmosphere and all of the bodies in outer space. It includes the study and forecasting of weather. Oceanography involves the study of the oceans on the earth's surface. It involves, among other things, the study of tides, currents, waves, water temperature, and the plants and animals that live in the water of the ocean.

PHYSICAL SCIENCE

Physical science deals with how the things about us are made, what they are made of, and the forces that act upon these things. Physical science can be divided into several groups including **chemistry**, **biochemistry**, **physics**, and **astronomy**. Chemistry is concerned with the composition of materials and how the components of these materials react. Chemists have found that all materials are made of elements. There are only about 100 elements. Biochemistry involves the chemical compounds and processes that are present in plants and animals. Physics is concerned with matter and motion, i.e., why and how things move and the forces that act upon them. Astronomy is a theoretical science involving the celestial bodies of the universe, including the sun, moon, planets, and stars. It is concerned with size, shape, temperature, and chemical composition of these bodies.

MATHEMATICS

Mathematics is a science that is fundamental to the other sciences, engineering, and human affairs. It is one of the oldest and most basic sciences. At the present time it is becoming more important because of the use of electronic computers. Mathematics may be divided into two broad classes: applied mathematics and pure or theoretical mathematics. Applied mathematics is concerned with the development of solutions to problems in the other sciences. Theoretical mathematics involves the development of principles and discovery of relationships among mathematical forms. Mathematics and algebra, geometry, trigonometry, and general mathematics are synonymous to most high school pupils.

SOCIAL SCIENCE

Social science can be conveniently divided into six groups which include **anthropology**, **economics**, **geography**, **history**, **political science**, and **sociology**.

ANTHROPOLOGY

Anthropology is the study of man from primitive conditions to his present level of civil development. It includes man's origin, physical characteristics, customs, languages, traditions, material possessions, and social and religious beliefs and practices. The major areas of anthropology are archeology, ethnology, and linguistics.

ECONOMICS

Economics is concerned with the production of goods and services which satisfy the wants of man. It involves the establishment of price structure by means of supply, demand, etc.

GEOGRAPHY

Geography is the science of the earth and of the life that is on it. Geographers attempt to describe the physical characteristics of the earth, including minerals, soils, water, vegetation, climate, and terrain. There are several different kinds of geography. **Economic** geography deals with the location of economic activities, such as mining, forestry, farming, and manufacturing. **Political** geography is the study of political forces upon geographic boundaries. **Urban** geography is a study of cities and community planning. **Physical** geography is a study of the earth's physical characteristics. **Cartography** is a special field of geography involving the design and construction of maps.

History is a study of events that have occurred in the past. It involves investigating past events and the recording of the findings of such investigations as perceived by the historian. Historians who specialize in identifying, preserving, and making available documentary materials are known as **archivists.**

POLITICAL SCIENCE

Political science is the study of all levels of government – city, county, state, regional, national, and international. It is concerned with what the government is, what it does, how it does it, and why.

SOCIOLOGY

Sociology is concerned with the origin and evolution of society, especially of the groups formed by man. These groups include families, tribes, communities, states, religious, social, political, and many others.

The science interest category is primarily concerned with occupations related to science as it is commonly studied by pupils enrolled in high school courses of biology, sociology, economics, history, mathematics, general science, chemistry, and physics. It is concerned with those occupations which require a relatively high level of knowledge and skill in science. However, the benefits of science are not limited to this occupational interest category. A knowledge of science is required in a large number of occupations in the other interest categories. This category of occupations includes those occupations in which the people employed have a **special** interest in science. In the social sciences, only the occupations in anthropology, geography, and political science are included in this occupational interest category.

II. WHAT ARE THE OCCUPATIONS IN THE SCIENCE INTEREST CATEGORY?

The occupations in the science interest category are grouped much as are the occupations in the other interest categories. Groups I and II do not have any occupations. The occupations which require an interest in science that could be listed under groups I and II are found in the technology interest category. Listed below are the occupations in the science interest category according to whether they are in natural or social science. The occupations are also clustered under the respective kinds of science. A brief description of what each of the occupations involves is also given.

NATURAL SCIENCE

The following is a list of occupations in the science interest category that involves interest in natural science. These occupations have been clustered according to biological science, physical science, earth science, and mathematics. The list also indicates the group, or level, in which the occupation is located.

BIOLOGICAL SCIENCE

GROUP I

Anatomist – a person knowledgeable in the structure and functions of the parts of plants and animals. Such a person dissects and examines the various parts.

Biophysicist – an occupation in which living cells and organisms are studied. Research may be relied upon to determine the electrical and mechanical energy emitted by cells and organisms.

Biochemist – studies the chemical processes that occur in living organisms, especially the action of foods, drugs, serums, hormones, and other substances upon living organisms.

Botanist – is concerned with all aspects of plant life including development, physiology, heredity, environment, distribution, structure, and economic value.

Embryologist – is concerned with the formation and development of embryos in plants and animals.

Geneticist – studies the inheritance and variation that is found in all forms of life – both plant and animal life.

Microbiologist – studies, identifies, and grows all forms of bacteria and other microscopic organisms.

Osteopath – is commonly known as a physician. The occupation involves examination of the human body and practice of a medical theory which holds that disease is due chiefly to tissues which are improperly arranged.

Physician – diagnoses and treats diseases and disorders of the human body.

Physiologist – is generally concerned with the structure of cells and organs and the functions of these in plants or animals.

Psychologist – there are several kinds, but they are all generally concerned with the mental processes of the human body.

Zoologist – studies the origin, classification, diseases, genetics, etc., related to animal life.

Group II

Agronomist – conducts research into the growing of agronomic crops.

Dentist – diagnoses and treats diseases, injuries, and malformations of teeth and gums.

Dietitian – specializes in planning and directing the preparation of food and drink to meet nutritional requirements of the human body.

Entomologist – investigates insects in relation to plant and animal life.

Home Economist – promotes, develops, and interprets homemaking procedures conducive to good health and welfare of individuals and families.

Horticulturist – studies all aspects of the growing of fruit, vegetables, nuts, flowers, berries, and shrubs.

Husbandry specialist – concerned with all aspects of livestock production.

Medical librarian – manages library containing documents on medicine and the medical profession.

Nurse (RN) – a professional who specializes in the care of injured and ill persons.

Nutritionist – studies the role of nutrition in health and disease control.

Optometrist – examines eyes and prescribes corrective procedure.

Pharmacologist – studies effects of drugs and other substances on animal life.

Sanitarian – concerned with environmental health including food processing and serving, air pollution, sewage disposal, etc.

GROUP III

Chiropractor – specialist in adjustment of body to prevent disease and correct abnormalities.

County Agricultural Agent – instructs and advises farmers concerning agricultural problems.

Dental hygienist – involved in care of teeth and instruction of general public in proper care of teeth and mouth.

Medical Technologist – performs laboratory tests on specimens of the human body to detect disease.

Podiatrist – concerned with diagnosing and treating diseases of the human foot.

County home demonstration agent – instructs and advises women in improvement of rural family life.

Group IV

Laboratory technician – performs laboratory work involving the testing and analysis of substances.

EARTH SCIENCE

Group I

Astrogeologist – applies knowledge of the earth's geology in studying the surface conditions on the moon and other planets.

Geologist – studies the composition, history, and structure of the surface of the earth.

Geomorphologist – studies the form of the earth's surface including changes caused by erosion, glaciation, and sedimentation.

Geophysicist – concerned with many things, including the composition and physical aspects of the earth's surface, such as size, shape, and other phenomena.

Geochemist – studies the chemical composition of and changes in minerals and rocks.

Meteorologist – studies atmospheric conditions to forecast weather.

Mineralogist – examines, analyzes, and classifies minerals and precious stones.

Oceanographer – studies oceans to observe characteristics, movements, physical properties, and forms of plant and animal life that live in the ocean.

Paleontologist – investigates fossils as found on or in the earth in an attempt to trace the evolution and development of past life.

Petrologist – studies the composition, structure, and history of rock formations and attempts to determine the changes taking place in the formation.

Sedimentologist – studies the processes by which sedimentary rocks are formed.

Stratigrapher – analyzes fossils and minerals to determine the distribution and arrangement of sedimentary rock.

Group II

Climatologist – interprets data on past rainfall, sunshine, wind, temperature, and other climatic phenomena in order to predict future climatic conditions.

Geodesist – establishes bench marks and other points that can be used in making maps.

Geomagnitician – establishes magnetic observations to chart earth's magnetic field.

Hydrologist – studies development, distribution, and disposition of waters of land areas.

Tectonophysicist – investigates movement of materials in the earth's crust and attempts to explain the forces causing the movement.

Group III

Soil scientist – studies characteristics of the soil, including the making of maps to show the location of known soils.

Soil conservationist – plans and develops practices to conserve the soil and increase soil fertility.

PHYSICAL SCIENCE

Group I

Astronomer – studies the celestial bodies.

Astrophysicist – an astronomer who specializes in temperature, amount of light emitted, and chemical composition of celestial bodies.

Astrometrist – an astronomer specializing in measurement of celestial bodies.

Chemist – investigates the composition and properties of matter.

Physicist – observes and analyzes the forms of energy, structure of matter, and relationship between matter and energy.

Spectroscopist – examines metals and minerals to determine composition and variation in composition.

Group II

Synoptic meteorologist – known as a weather forecaster.

Pharmacist – prepares and dispenses medications as directed by physicians.

Group III

X-Ray technician – operates X-Ray equipment (also known as radiography equipment).

Group IV

Dispensing Optician – prepares eyeglass lenses to prescription specifications, puts lenses in frames, and adjusts frames to customer.

MATHEMATICS

Group I

Statistician – plans, collects, organizes, interprets, summarizes, and analyzes numerical data.

Group II

Mathematician – conducts research, develops ideas for applying mathematics, and applies mathematical formulas to data.

SOCIAL SCIENCE

Only a small number of the occupations in social science are included in the science interest category. The other social science occupations are to be found in other categories.

ANTHROPOLOGY

Group I

Anthropologist – studies the origin and development of man including the characteristics of present and past civilizations.

Archaeologist – attempts to reconstruct past civilizations by digging into the earth to locate the remains of homes, clothing, tools, and other evidences of past life.

Ethnologist – studies the way of life of people, especially the more primitive civilizations, by living among them.

Linguist – an anthropologist who specializes in languages.

GEOGRAPHY

Group I

Geographer – studies the characteristics of the earth, including minerals, water, vegetation, climate, soils, and terrain.

Group II

Cartographer – designs and constructs maps.

POLITICAL SCIENCE

Group I

Newspaper Reporter – gathers information on current events and writes articles describing these events for publication in newspapers.

III. WHAT IS THE SIGNIFICANCE(SCOPE) OF OCCUPATIONS INVOLVING SCIENCE?

Occupations which require special interest in science are very important. The largest number of persons with occupations in natural science are in the physical sciences. In 1967 more than 195,000 persons were in occupations in physical science. Of these, 122,000 were in chemistry, 44,000 in physics, 1,100 in astronomy, and 28,500 were in the other physical sciences.

The biological sciences employed 155,000 persons in 1967. Most of these were in biology, agriculture, and medicine. The number employed was: biology – 68,000, agricultural scientists – 47,000, and medicine – 40,000.

Fewer persons are employed in earth science than in the other natural sciences. A total of 26,500 scientists are employed in the earth sciences. The largest number of these are employed in geology (15,000). Other earth science employees are geophysics (5,000), meteorology (3,500), and oceanography (3,000).

The number of people employed in mathematics-related occupations has been steadily increasing in recent years. There are presently about 57,000 mathematicians in the United States, not including teachers of mathematics. There are also 22,000 employed in statistics and 3,000 employed in other mathematics occupations.

SOCIAL SCIENCE

The number of persons employed in the social sciences is considerably less than the number in the natural sciences. About 50,000 people are currently employed in social science. There are about 2,700 employed in anthropology, 20,000 in economics, 3,500 in geography, 10,000 in history (not including history teachers), 9,000 in political science, and 5,000 in sociology. (Some of the occupations in the social sciences that are listed above are discussed in other occupational interest categories.)

IV. WHAT ARE THE CHARACTERISTICS OF THE OCCUPATIONS IN BIOLOGICAL SCIENCE?

NATURE OF THE WORK

Biological science is concerned with plants and animals. People employed in biological science occupations are known as biological scientists. Frequently, biological scientists specialize in either plants or animals. Those who specialize in plants are botanists and those specializing in animals (zoology) are known as zoologists. Some biologists develop specialties with one kind of plant or animal. Biological science may be divided into three broad areas – biology, medicine, and agriculture.

The work of a biological scientist involves the study of the structure, development, behavior, and life processes of plants and animals. The relationship between plants and animals is also studied. Many biological scientists are engaged in research and development. The research may be confined to air conditioned indoor laboratories with very little contact with the outside world, or may take place in strange environments that are relatively unexplored. Biologists may work in conditions similar to those of the hot, steamy Amazon jungle or the snow-covered mountainous regions of the North. Biological work may be carried on in the conditions of your local community. Time may be spent sitting in a laboratory looking through a microscope at tiny plants or animals that could not be seen with the unaided eye. Some biologists may spend considerable time dissecting animals and examining each part for disease or malformation. Others may study genetics and attempt to develop plants and animals with special features.

Most biologists must have a good knowledge of mathematical and statistical procedures. They must also be able to read well since quite often many hours are spent reading technical journals and research reports. Research biologists must also write their findings for publication so that what has been learned from their research can be shared with other biologists. A number of biological scientists have combined the careers of teaching and research. Biologists must also frequently assume responsibility in management and administrative work.

LOCATION

Biological scientists are employed in many places and by many employers. Almost half of them are employed by colleges and universities. Those specializing in medicine may be self-employed or employed by medical schools and hospitals. Biological scientists specializing in agricultural science are often employed by agricultural colleges and experiment stations. The United States Department of Agriculture employs about 20,000. Fish and wildlife agencies employ many of those with special interest in this phase of biology. Many biologists find employment with private industry. In 1967, 33,000 biological scientists were employed by industry. Most of these were with chemical manufacturers, food processors and producers, and drug manufacturers.

Occupations for biological scientists are found in all states, but a third of them are found in California, New York, Illinois, Maryland, and Pennsylvania. Both men and women are employed in biological science. However, most of them are men.

EDUCATION NEEDED FOR ENTRY AND ADVANCEMENT

The biological science occupations included in this category require a relatively high level of knowledge and skill. Many require advanced degrees, such as the Ph.D., in fields of special interest. A bachelor's degree is adequate for many of the beginning jobs but is frequently not sufficient for advancement to higher positions. Students planning to become biological scientists should obtain the broadest education possible prior to entering specialized study.

EARNINGS AND FRINGE BENEFITS

The earnings of persons employed in biological science occupations vary with education, experience, and ability to get a job done. A biological scientist with a bachelor's degree just beginning employment could expect a beginning salary of $5,500 to $6,500 per year. The salary increases rapidly with advanced educational preparation. Biological scientists with Ph.D. degrees can expect beginning salaries of around $10,000 or more. The average annual salary for all biological scientists in 1966 was $12,000. Ten percent of these earned more than $21,000, while another ten percent earned less than $7,400 a year. Many biological scientists have paid vacations, sick leave, and other benefits. Those employed by universities may be eligible for sabbatical leaves of up to one year with full pay.

EMPLOYMENT OUTLOOK

Demand for biological scientists will be strong in the next few years, especially for those with advanced education and degrees. Persons with bachelors degrees can be expected to find employment as research assistants or technicians. It has been estimated that around 5,400 biological scientists will be needed each year for the next few years to fill new positions and replace those who leave. One of the areas of greatest demand will be in research, especially research in developing new drugs, chemicals, and processing methods.

RELATIONSHIP OF SUBJECTS TAKEN IN HIGH SCHOOL TO BIOLOGICAL SCIENCE OCCUPATIONS

All biological scientists need to be able to read, speak, and write well; therefore, all pupils contemplating careers in biological science should take those subjects which will improve their communication skills. Prospective biological science pupils should obtain a broad education in biology and related sciences, such as chemistry, physics, and mathematics. Those contemplating agricultural science careers should study agriculture.

V. WHAT ARE THE CHARACTERISTICS OF OCCUPATIONS IN EARTH SCIENCE?

NATURE OF WORK

Many earth scientists specialize in one aspect of earth science. Such specialization may mean that the occupation involves work which is almost totally outdoors. Other earth science occupations may demand that most of the working time be spent inside. Some of the earth scientists use very complex instruments which require considerable education for operation. The time of many geologists is spent outdoors studying the structure of the earth with the aid of scientific instruments, and mapping what is discovered. Geophysicists study many of the things studied by geologists, except that they are more concerned with the physical characteristics of the earth. Physics, mathematics, chemistry, and other sciences are frequently used. Geophysicists may use seismographs to measure and record the movement of the earth. Many geophysicists are involved in searching for oil and mineral deposits. Meteorologists study the atmosphere in an attempt to understand ingredients, motion, processes, and influences acting upon the earth. Meteorologists are best known for their work in forecasting the weather. Some attempt to solve problems related to air pollution treatment, "making rain," etc. A number of meteorologists are involved in teaching and research at colleges and universities. Oceanographers are concerned with the water that covers two-thirds of the earth's surface. The work of oceanographers is concerned with the characteristics, movements, physical properties and life in the ocean. They may take the temperature of the water, investigate tides, caves, and currents. Samples, specimens, and data are collected and analyzed. The ocean floor may be investigated. Some oceanographers spend nearly all of their time on ships at sea. Others never board ships.

LOCATION

Many occupations in earth science are found close around us. They are with private industry or government. Most geologists are employed by private industry, especially by oil companies. The states with the greatest amount of oil production also have the largest number of geologists. Some geologists are placed in foreign countries by their employers for varying periods of time. Geophysicists are also largely employed by private industry, especially mining, oil, and gas companies. Some are employed by exploration and research firms. Most meteorologists are employed by the federal government but a few are employed by industry. Oceanographers are employed by research laboratories and the Federal government. Colleges and universities employ persons with interests in all four of the main occupations in earth science.

EDUCATION NEEDED FOR ENTRY AND ADVANCEMENT

All of the professional occupations in the earth science group require that the persons employed in these occupations have at least a bachelor's degree with a major in one of the earth sciences. The master's degree is required for most research and teaching positions in geology, geophysics, meteorology, and oceanography. Persons seeking the top positions should obtain a doctor's degree. The curriculums of very few colleges provide the necessary courses needed to become an earth scientist. A person interested in an occupation in earth science for a career should choose a college or university that offers the necessary courses. Important courses that should be taken by all students contemplating a career in one of the earth science occupations are physics, mathematics, chemistry, biology and any courses in the area of specialization.

The person just beginning employment in an earth science occupation should expect to start as research or laboratory assistant. Persons with experience in earth science are usually chosen for the administrative positions.

EARNINGS AND FRINGE BENEFITS

A person with a bachelor's degree just beginning employment in one of the earth science occupations can expect an annual salary of $7000-8000. Those with a master's degree can expect to receive

$1000-1500 more. Starting salaries for those with doctor's degrees range from $10,000 to $12,000, or more, per year. Salaries usually increase as experience is gained. The salaries for those employed by industry are somewhat more than those employed by the government and colleges or universities. Earth scientists who work outside of the United States usually receive additional allowances.

EMPLOYMENT OUTLOOK

The opportunity for employment in earth science is considered to be favorable during the next few years. Persons with advanced degrees will be in special demand. Also, those graduating who rank high in their class will be in greater demand. The greatest increase in demand for earth scientists will probably be in industry with a moderate demand in government jobs. The demand for persons to teach the earth sciences in colleges and universities will increase due to the increased number of students studying the earth sciences.

RELATIONSHIP OF SUBJECTS TAKEN IN SCHOOL TO BIOLOGICAL SCIENCE OCCUPATIONS

High school students interested in pursuing careers in earth science should take courses in mathematics, chemistry, physics, and the biological sciences. All prerequisites for entering a college or university which offers the desired curriculum in geology, geophysics, meteorology, or oceanography should be taken in high school.

VI. WHAT ARE THE CHARACTERISTICS OF THE OCCUPATIONS IN PHYSICAL SCIENCE?

NATURE OF THE WORK

The major occupations in physical science are in chemistry, biochemistry, physics, and astronomy. Many of the persons employed in occupations in these sciences are concerned with basic research. This basic research is concerned with the properties of matter and energy. Chemists are concerned with the composition of matter. To determine the characteristics of matter, chemists frequently spend many hours in a laboratory observing reactions that occur in test tubes, keeping careful records of what they observe, and experimenting to see what will occur when certain chemicals are mixed. The work is often slow and meticulous. The environment of a chemist's laboratory is frequently filled with complicated apparatus and has a pungent odor of chemicals. Chemists also frequently write papers and give lectures on what they have observed.

The work of biochemists is similar to that of chemists except that biochemists are concerned with the chemical processes that occur in relation to plant and animal life. Biochemists analyze the processes that occur in plants and animals and how these processes are affected by food, drugs, and other substances that are introduced. This study is especially important in medicine, nutrition, and agriculture. In the medical field, biochemists investigate the causes and cures of disease. In nutrition, they study the nutrients necessary for good health and how deficiencies of certain nutrients affect an organism. In the field of agriculture, biochemists investigate soils, fertilizers, and plants for improvement and relationship to each other.

The work of physicists is important in many aspects of our society. About one-half of all physicists' work is involved in research aimed at helping man understand the physical world around him. They are interested in the interaction between matter and energy. Mathematics is used considerably in the analysis of interactions. Physicists spend much of their time working in laboratories with scientific equipment. They have to design and construct much of the new and specialized equipment they use. Physicists also teach in colleges and universities.

Astronomers study the stars, sun, moon, and planets in an attempt to determine sizes, shapes, surface temperatures, chemical composition, and movements of these bodies. Complex instruments are used in the study. Astronomers usually teach, do research, or perform a combination of teaching and research. Considerable time may be spent in an observatory looking through a telescope. Various photographic and light-measuring devices may be attached to the telescope.

LOCATION

Most of the persons with interests in physical science are employed near heavily populated areas, such as Chicago, New York, and Philadelphia. Two-thirds of the chemists are employed by private industry engaged in food manufacture, petroleum products, paper manufacture, electrical equipment manufacture, and metals products manufacture. Others are employed by chemical, drug, food, and petroleum products companies; research laboratories; colleges and universities; and federal government agencies.

Biochemists are employed by colleges, universities, hospitals, industry, and government agencies. Most are concerned with chemicals, foods, drugs, insecticides, and cosmetics.

Many physicists are employed by private industry, especially in the electrical equipment industry. Others in industry are employed by machinery, engineering, architectural, chemical, aerospace, and instruments industries. A large number of physicists are employed by colleges and universities in teaching and research. Government agencies employ a number of physicists.

The number of astronomers is small (1,100 in U. S.); therefore, the opportunities for employment are limited. Astronomers are employed by private industry and the federal government. A few are employed by colleges and universities.

Most of the opportunity for employment in physical science occupations is in the more heavily populated states. However, there are a few occupations for persons interested in physical science in Mississippi.

EDUCATION NEEDED FOR ENTRY AND ADVANCEMENT

The minimum education for beginning employment in physical science occupations is a bachelor's degree. For advancement to higher positions, master's and doctor's degrees are essential. Persons with the widest experiences are usually the first to be advanced. Successful physical scientists, as in many other occupations, must keep their knowledge up-to-date by reading technical journals and attending conferences in which physical science subjects are discussed.

EARNINGS AND FRINGE BENEFITS

Persons with bachelor's degrees just beginning employment in physical science occupations can expect to receive $7,000-8,000 annual starting salary. Master's degrees usually add about $1,000 to the salary. Those with doctor's degrees may start at $10,000-12,000 per year with advancement in salary as experience is gained. A number of physical scientists earn nearly $20,000 per year.

EMPLOYMENT OUTLOOK

The employment outlook for occupations in the physical sciences is considered to be very good during the next few years. Persons with advanced degrees will be in greatest demand. Growth in many of the physical science occupations is currently occurring at a very rapid rate.

RELATIONSHIP OF SUBJECTS TAKEN IN SCHOOL TO BIOLOGICAL SCIENCE OCCUPATIONS

High school students interested in physical science occupations should take mathematics, chemistry, physics, and biology courses in high school. All courses prerequisite to entering a college curriculum in physical science should be taken. A high school student interested in majoring in one of the physical sciences in college should select an appropriate college and study the curriculum in which he wishes to enroll.

VII. WHAT ARE THE CHARACTERISTICS OF THE OCCUPATIONS IN MATHEMATICS?

NATURE OF THE WORK

Mathematicians are used in a variety of activities. Some people are engaged in theoretical work involving the development and discovery of new mathematical principles and relationships. Others are engaged in attempting to solve problems in the physical, earth, biological, and social sciences. Most of the work is performed indoors at a desk, calculator, or electronic computer. Many times they attempt to answer problems proposed by engineers and other scientists. For example, a mathematician may be called upon to compute the size of a steel beam necessary in the construction of a bridge or building. To solve this problem, the mathematician must compute the load-bearing capacity of the steel and how much load any given steel beam in a bridge must carry. Other mathematicians are engaged in teaching, quality control, management, and administration.

LOCATION

About one-half of the 57,000 mathematicians in the United States are employed in industries, such as manufacturers of electrical equipment, aerospace equipment, and machinery. A few work for the government. More than half of the mathematicians are found in seven states: Maryland, New York, Illinois, California, Pennsylvania, Massachusetts, and New Jersey.

EDUCATION NEEDED FOR ENTRY AND ADVANCEMENT

The minimum education required for entering an occupation in mathematics is a bachelor's degree in mathematics. A curriculum leading to a degree in mathematics is offered by many colleges and universities. More and more jobs require mathematicians with degrees beyond the bachelor's degree. Master's and doctor's degrees are necessary for most advancement and salary increases.

EARNINGS AND FRINGE BENEFITS

Starting salaries for persons with bachelor's degrees in mathematics are around $6,000-8,000. A master's degree usually adds about $1,500 to the salary. Mathematicians with doctor's degrees commonly receive an annual salary ranging from $10,000 to $17,000. Ten percent of the mathematicians earn more than $20,000 per year.

EMPLOYMENT OUTLOOK

Mathematics grows as scientific research grows. The indications now are that scientific research will grow rapidly in the immediate years ahead. Very rapid growth in the number of persons employed in mathematics is expected during the next few years. The education required for occupations in mathematics is also an excellent foundation for a number of other occupations.

RELATIONSHIP OF SUBJECTS TAKEN IN SCHOOL TO BIOLOGICAL SCIENCE OCCUPATIONS

A high school student contemplating entering a mathematics occupation and majoring in mathematics in college should take as many mathematics courses as possible while in high school. It is also a good idea to take chemistry, physics, biology, or accounting courses which deal with the practical aspects of mathematics.

VIII. WHAT ARE THE CHARACTERISTICS OF OCCUPATIONS IN SOCIAL SCIENCE THAT ARE INCLUDED IN THE SCIENCE INTEREST CATEGORY?

NATURE OF THE WORK

The social science occupations included in the science interest category are in anthropology, geography, and political science.

The nature of an anthropologist's work is easily stated. It is the study of man from his origin to his present status. Some anthropologists spend considerable time digging into the earth searching for evidence of past civilizations. These are known as archaeologists. They examine skeleton remains, relics, and artifacts. Other anthropologists attempt to study the ways of life of primitive tribes. These are known an ethnologists. Ethnologists compare the cultures of various groups of people and study the sounds and structure of their language. Those who study language are frequently known as linguists. Still another kind of anthropologist is the physical anthropologist. The physical anthropologist is interested in studying the human body and how it evolved into its present form. Attention is also given to the differences among races and groups of mankind.

Geographers analyze the physical characteristics of the earth. They may study the location of minerals, water, soils, and related phenomena. Some of their time may be spent using surveying and meteorological instruments. Other time is spent analyzing maps, aerial photographs, and other data. The findings must also be plotted on a map or photograph. Many geographers teach part-time.

Political scientists study governments at all levels and in all countries. They frequently specialize in public administration, American Government, or in the relationship between the governments of the various countries of the world, i.e., international relations. Many political scientists teach either part-time or full-time. Much of their work is in research concerning legislation, public opinion, and political trends.

LOCATION

Most anthropologists, geographers, and political scientists are employed by colleges and universities. A sizable number are employed by the federal government. A few are with industry and nonprofit organizations. Most of these occupations are found near the larger cities, especially Washington, D. C. with its many government jobs. Some are sent to foreign countries on special assignments.

EDUCATION NEEDED FOR ENTRY AND ADVANCEMENT

The minimum education required for entering anthropology, geography, or political science occupations is a bachelor's degree. The doctor's degree is required for most permanent occupations in anthropology. It is very important that an appropriate college be selected. Graduate work is beneficial, and frequently required, for a number of the jobs in geography and political science. Advancement to the top positions is based upon education and experience.

EARNINGS AND FRINGE BENEFITS

Annual salaries of anthropologists range from $9,000 to more than $16,000. (Note that a doctor's degree is generally required.) The salaries of geographers range from $5,000 for a beginner with a bachelor's degree to $10,000 or more for those with doctor's degrees. Earnings of political scientists range from $5,000 to $16,000 or more per year. Persons with occupations in these areas frequently do consulting work for which they receive additional pay.

EMPLOYMENT OUTLOOK

The employment prospects for anthropologists and political scientists is expected to increase rapidly over the next few years. The outlook for geographers is favorable but is not as good as the outlook in anthropology and political science.

SUGGESTED ACTIVITIES FOR STUDENTS

Select one or more specific occupations in the science category in which you are interested. Make a detailed study of the occupation(s) selected by using pamphlets, bulletins, books, occupational briefs, and other materials. Attempt to determine the following information for each occupation which you selected:

A. What does the occupation involve? Do I like it?
B. What kind of work do people employed in the occupation do? Do I Like it?
C. Where is employment in the occupation available? Would I be willing to go there to work?
D. What is the salary for the occupation? Do I find this amount acceptable?
E. What education and training is required for entering the occupation? Do I want to get this education and training?
F. Where is the required education and training obtained? Do I want to go there to get it?
G. How long will it take to get the necessary education and training? Do I want to go to school that long?

Select and conduct one or more of the following activities:

A. Biological Science
  1. **Structure and functions of the parts of plants.** Do the following in the order listed:
    a. Select a common plant (preferably one such as a cotton plant, zinnia, or marigold).
    b. Carefully pull the selected plant from the soil being careful not to damage any of its parts.
    c. Divide the plant into its major parts–leaves, stems, roots, flowers, seed pods, etc.
    d. Attach each part with tape, string, or wire, to a sheet of poster paper.
    e. Label each part.
    f. Place a description of the functions of each part on the poster paper beneath the names. (The functions of plant parts can be found in general science, biology, and botany books.)
  2. **Growth and development of plants.** Do the following steps in the order listed:
    a. Secure two 6" flower pots.
    b. Place fertile potting soil in each pot.
    c. Plant several corn grains in one pot.
    d. Plant several lima bean seed in the other pot.
    e. Water the soil (Caution: DO NOT over water.)
    f. Place the pots on a window sill or in a similar location.
    g. Check the flower pots daily.
    h. Let seedlings grow for 3 days following emergence from the soil.
    i. Make a list of the differences in the way the plants grow.
    j Use a general science, biology, or botany book to locate the scientific names and meaning of the difference in the growth and development characteristics that was observed.
    k. Write a one page summary of your procedure and what you observed, using the terminology that you think a botanist would use in writing a technical report.
  3. **Effect of light on plants.** Perform the following steps:
    a. Secure a potted plant.

   b. Place the plant in a dark room where runlight cannot reach it.
   c. Leave the plant in the dark room 4-5 days.
   d. Remove the plant from the dark room and observe.
   e. Refer to general science, biology, and botany books to help interpret what happened to the plant.
   f. Write a one page paper on the changes in the plant that you observed and why the changes occurred. (Use the terminology that a scientist would use in writing a technical report.)

4. **Anatomy.** Make a trip to a dianistic laboratory and observe the performance of a post-morten on a large animal. Note the kind of animal, the procedure used, the appearance of the internal organs, and the indication that disease was present. Also, have the laboratory worker, usually a veterinarian, sever the intestines. Look closely for the presence of worms, and foreign objects, such as wire or nails. Write a one page report of what you observed. (It may be possible that these observations could be made in a veterinary clinic.)
5. Contact a medical or dental clinic and arrange for a tour of the facilities. Have someone familiar with the clinic explain how the clinic functions and is organized.
6. Contact an agricultural experiment station and arrange for a tour of the station. Have someone knowledgeable in the operation of the experiment station explain the experiments currently in progress.
7. **Entomology.** Make an insect collection by following these steps:
   a. Collect ten of the insects with the most economic importance in your home area.
   b. Mount each insect with its name (common and scientific) on a sheet of poster paper.
   c. Below the name of each insect list the beneficial effects and nonbeneficial effects of each insect.
   d. Describe how it feeds and on what it feeds.
   e. Briefly describe its life cycle. (Use biology and entomology books as references in this activity.)
8. **Nutrition.** Perform the following project in nutrition:
   a. Study the nutrients essential in the diet of man.
   b. Develop a list of where each of these nutrients is obtained, i.e., which foods contain each of these nutrients.
   c. Plan the meals of one adult person, or a family, for one week being sure that all nutrient needs are met.
   d. If possible, attempt to have the plans you made put into practice with your family.
   e. Develop a chart on poster paper showing the foods that you plan to serve each meal.
9. **Dietetics.** Perform the following activities in dietetics:
   a. Schedule a conference with your school's lunch-room dietitian.
   b. During the conference determine answers to the following questions:
      Who establishes the menu of food to be served?
      What are the criteria for determining which foods will be served?
      What legal and sanitation regulations must be observed?
      Where are the foods which are served obtained?
   c. Write a report of the findings of your conference with the dietitian.

10. **Psychology and Psychiatry.** Arrange for a conference with the school psychologist or have a psychologist or psychiatrist visit the class and explain the occupations in psychology and psychiatry.
    a. Read a book by one of the following persons: Alfred Adler, Sigmund Freud, John B. Watson, B. F. Skinner, E. R. Guthrie, Elizabeth Hurlock, or David P. Ausubel.
    b. Visit an institution established for persons who are mentally ill.

B. Earth Science

1. **Meteorology.** Perform one or more of the following:
    a. Collect weather maps for a period of one week as published in newspapers. Write a summary of what the maps showed, the forecasts that were made, and what the weather in your community was actually like.
    b. Set up a thermometer and take readings each day on a regular schedule. Place the thermometer so that it is outside but in the shade at all times. It is suggested that a chart be developed for recording the temperatures for a period of one to two weeks at least three times daily. The chart should be set up as a table to aid in keeping the records.

Date	Time		Temperature
	AM	PM	

    c. Set up a rain guage and keep an accurate record of precipitation for a period of one month.
    d. Keep a record of barometric pressure using a barometer and a procedure similar to that given above for temperature records.
    e. Visit a local weather station and interview the meteorologist regarding his work.
2. **Geology.** Perform one or more of the following:
    a. Make a collection of rocks in your community. Identify the minerals present in each rock. Place the rocks and a description of the minerals which they contain on display in your classroom. (Refer to a general science book and books on minerals.)
    b. If there is an oil well being drilled nearby visit it and inquire about the problems encountered in drilling a well. Specifically discuss the kinds of earth formations that must be drilled through. Write a one page summary of what the earth's structure beneath the well is apparently like.
3. **Soils.**
    a. Contact the local Soil Conservation Service and arrange for a staff member to visit your school and explain what a soil conservationist does.
    b. Collect samples of sand, clay, and silt. Determine how these compare with the soil normally found in your community. Make a display in which you describe the water-holding capacity, tilling ability, and productivity of soils high in sand, clay, and in silt. List the crops which will grow best on each kind of soil.
    c. Collect a soil sample from the lawn or garden at your home or from the school ground. Use a soil test kit to analyze the soil, and determine the kind of fertilizer that should be added for plants growing where you took the sample. (Obtain information on how to take a soil sample from a vocational agriculture teacher, county agent, or soil conservation service worker.)

C. Physical Science

1. **Astronomy.**
   a. Construct a time-zone map of the United States showing the five time zones as found in the 48 states of the continental United States. Indicate what the time in each of the zones would be if it were 8:00 in your home town. (Consult general science or geography books if necessary.)

   b. Use a globe and a light bulb to show how the rotation of the earth causes night and day.
      (1) Darken the room.
      (2) Place a small light bulb in the center of the table.
      (3) Turn the light on.
      (4) Hold the globe so that the light shines directly on the equator with the axis of the globe perpendicular to the top of the table. Rotate the globe on its axis. The part of the globe that is lighted by the bulb is the part that would be lighted by the sun. Note how the daylight is distributed.
      (5) Tilt the globe so that its axis is inclined at an angle of 23 1/2 degrees. (This is the true position of the earth relative to the sun.) Rotate the globe. How does tilting the globe affect the distribution of light? How does tilting the globe affect seasonal changes in the weather? Refer to general science books if necessary.
      (6) Write a one page technical report of your procedure and observations.

   c. View one or more of the following motion pictures:
      The Earth: Its Movements
      The Earth: Its Atmosphere
      The Solar System
      Space Science: Comets, Meteors, and Planetoids
      Space Science: The Planets
      Space Science: Man-Made Satellites
      Space Science: Studying the Stars
      (Each of these films should serve to acquaint students with the nature of occupations in astronomy. All of the above films are available from Coronet Films, Chicago, Ill. 60601.)

2. **Physics.**
   a. Arrange for a physicist employed by a nearby college, university, industry, or government agency to visit class and discuss "What it is like to be a physicist".

   b. Arrange for a tour of the physics laboratory facilities of a nearby college, university, industry, or government agency. Talk to some of the physicists and technicians who work there.

   c. It is necessary for a physicist to measure length, mass or weight, and time precisely. Also, it is often necessary to convert from one system of measurement to another. As an exercise in measurement and conversion, perform the following: (Consult a physics book if necessary.)
      (1) Measure the length and width of this page in inches.
      (2) Convert the measurements obtained in inches to centimeters. (one inch = 2.54 centimeters.)
      (3) Compute the numbers of square centimeters on the surface of this page.

d. A floating body diplaces an amount of liquid in which it is floating equivalent to its own weight. Conduct an experiment to prove that this is true.
   - (1) Balance an overflow can on platform scales.
   - (2) Fill the can with water until it is overflowing.
   - (3) After the overflow can has been filled and has finished overflowing, place a dish or beaker to catch additional water that may overflow if more water is poured into the overflow can.
   - (4) Place a small block of wood in the water in the overflow can. The amount of water forced out is equal to the weight of the block of wood.
   - (5) Weigh the block of wood and the water that was forced out to see that they are equal.

3. **Chemistry.**
   - a. Take a soil sample and conduct a chemical analysis using a soil testing kit to determine the fertilizer needed and pH of the soil.
   - b. Arrange for a visit to a nearby chemical laboratory located in a college, university, industry, or government agency. Discuss the laboratory and the nature of the work that is performed there.
   - c. A compound is a pure substance which may be broken down into two or more simpler substances, known as elements. More than one hundred elements have been identified. Develop a list of these elements, the symbols for them, and the compounds in which the elements are commonly found. (Consult a chemistry or general science book.)
   - d. Oxygen is necessary for a flame (fire) to exist. Perform the following experiment to illustrate how oxygen supports combustion:
     - (1) Place a small candle upright on a table top.
     - (2) Light the candle.
     - (3) Fill a quart fruit jar with oxygen. (If this is done in a shop be sure that oxygen **alone** is being obtained.)
     - (4) Place a cover over the fruit jar to prevent the loss of oxygen.
     - (5) Place the fruit jar upside down over the lighted candle. Note what happens.
     - (6) Write a one page summary of your procedure and what you observed. (Refer to chemistry or general science books for assistance in explaining what happened.)

D. Mathematics
   1. View one or both of the following films:
      - a. How Man Learned to Count (Association Films)
      - b. Quicker Than You Think (Association Films)
   2. Invite a mathematician from a nearby college, university, or business to visit class and discuss the occupations available in mathematics.
   3. Make a tour of a business which makes use of electronic computers. Have a representative of the business explain the operation of the computers and the education necessary to become proficient in using such equipment.
   4. Become familiar with the operation of a calculating machine and an electronic calculator. Perform the following manipulations:
      - a. add
      - b. subtract
      - c. multiply

- d. divide
- e. accumulate
- f. multiply using a constant (or memory recall)
- g. set decimal position

E. Social Science

1. **Anthropology.**
   - a. Visit museum in which fossils, artifacts, and relics are on display. Have a tour-guide explain how the museum obtained the specimens it has on display.
   - b. Read one or more of the following:
     - Folkways by William Graham Sumner
     - Maori Youth by David P. Ausuble
     - Elmtown's Youth by August Hollingshead
     - Children of Brasstown by Celia B. Stendler
2. **Geography.**
   - a. View one or more of the following films:
     - Global Concepts in Maps – (Coronet Films, Chicago, Ill. 60601).
     - Introduction to Map Projection – (Universal Education and Visual aids, New York, N. Y. 10003).
   - b. Arrange for a tour of the Waterways Experiment Station near Clinton, Mississippi, to observe a scale model of the Mississippi River.
   - c. Make a map of your hometown or neighborhood showing streets, railroads, creeks, rivers, and other prominent features.
3. **Political Science.**
   - a. Arrange for a tour of a local newspaper's printing facilities. Talk with various staff members. Also discuss the various news wire services.
   - b. Write an article for your school newspaper, or local community newspaper. Contact the editor of it for suggestions as to style and length of article. Have your article published.

UNIT 8
GENERAL CULTURAL CATEGORY

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
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VOCATIONAL – TECHNICAL EDUCATION
MISSISSIPPI STATE UNIVERSITY
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GENERAL CULTURAL CATEGORY

TEACHER OBJECTIVES

1. To define the concept "general cultural" in relation to occupations.

2. To acquaint pupils with occupations in the General Cultural Category.

3. To stress the importance of General Cultural occupations.

4. To give students a brief characterization of the nature of the work in General Cultural occupations and to provide them with realistic experiences pertaining to these occupations.

5. To inform students where to seek employment in General Cultural occupations.

6. To acquaint students with educational requirements for entry and advancement in General Cultural occupations.

7. To inform students of the typical earnings and fringe benefits that can be expected by those employed in General Cultural occupations.

8. To give students information regarding the employment trends and outlook for occupations in this Category.

9. To encourage students to strive for excellence in their school work by acquainting them with the relationship of subjects taken in high school to educational requirements for General Cultural occupations.

STUDENT OBJECTIVES

1. To be familiar with the types of occupations classified as "General Cultural."

2. To realize the importance of occupations in the General Cultural Category and to recognize the influential role of those employed in such occupations.

3. To be able to characterize the nature of the work in General Cultural occupations.

4. To be familiar with the type of environment and location in which General Cultural occupations may be found.

5. To know the educational requirements for entry and advancement in General Cultural occupations.

6. To discuss the typical earnings and fringe benefits that can be expected by those employed in General Cultural occupations.

7. To know the employment trends and outlook for occupations in this Category.

8. To understand the relationship of subjects taken in high school to educational requirements for General Cultural occupations.

9. To increase knowledge of self in relation to these occupations.

10. To acquire information about and understanding of a specific occupation in the General Cultural Category through reading occupational information and by engaging in occupation-related activities.

11. To know what sources are available for in-depth study of specific occupations.

12. To be familiar with training in a specific occupation offered by several institutions.

QUESTIONS RELATING TO THIS CATEGORY

1. Why are the occupations in this category characterized as "General Cultural"?

2. What are the occupations in the General Cultural Category?

3. What is the importance of occupations in the General Cultural Category?

4. What is the nature of the work in General Cultural occupations?

5. Where is employment in General Cultural occupations found?

6. What are the educational requirements for entry and advancement in General Cultural occupations?

7. What are the earnings and fringe benefits in General Cultural occupations?

8. What is the employment outlook for occupations in the General Cultural Category?

9. What is the relationship between subjects taken in school and occupations in the General Cultural Category?

PHASE I: AN OVERVIEW

Help students reevaluate their personal characteristics, interests, aptitudes, and achievements that were discussed in the Orientation Section. Place special emphasis on the characteristics, interests, aptitudes, and achievements that are necessary for successful entrance and advancement in General Cultural occupations.

WHY ARE THE OCCUPATIONS IN THIS CATEGORY CHARACTERIZED AS "GENERAL CULTURAL"?

"These occupations are primarily concerned with the preservation and transmission of the general cultural heritage. The Group embraces occupations concerning the subjects usually called the humanities in college catalogues, but it is broader than these. It includes occupations in education, journalism, jurisprudence, the ministry, linguistics, and so on. All elementary and high school teachers are included in this Group. At higher levels teachers of science and art are placed in Groups VI and VIII. This is somewhat arbitrary, but it has been done to allow for the fact that teachers at the college level are often more interested in the subject matter than in teaching, and because, in art and science, teachers at the college level are frequently engaged in research or other creative activity which places them more appropriately elsewhere."[1]

"The occupations in this Group are most closely related to those in Group I because of the personal interest factor, and to those in Group VIII because of the cultural aspect."[2]

NOTE: Have students refer to Ann Roe's Groups - listed in Unit I, page 5. A questionaire - comment type form should be prepared for use in determining what the students know about the occupations listed in this Category. (See Appendix A for a sample pretest.) This will be of immediate value in assisting the student in occupational exploration and in evaluating his later learning.

WHAT ARE THE OCCUPATIONS IN THE GENERAL CULTURAL CATEGORY?

Encourage students to give examples of people they know who are employed in these occupations. Have them tell what they know about the occupation - the type work, environment, fringe benefits, etc. Show slides, if possible, of persons employed in these occupations as each is discussed.

GROUP I

A. Economist, university - guides students in learning the principles and methods of economics, and frequently engages in writing, lecturing, or consulting activities; does research in economic theory and formulates many of the new ideas that directly or indirectly influence government and industry planning.

B. Geographer, urban - studies the geography and helps develop comprehensive plans and programs for utilization of land and physical facilities of cities, counties, and metropolitan areas.

C. Geographer, political - studies the way political processes affect geographic boundaries on subnational, national, and international scales and the relationship of geographic conditions to political situations.

D. Historian - studies the records of the past and writes books and articles describing and analyzing past events, institutions, ideas, and people.

E. Lawyer - advises people of their legal rights and obligations and, when necessary, represents them in courts of law.

F. Librarian, college - works with students, faculty members, and research workers in general reference work or in a particular field of interest, such as law, medicine, economics or music.

G. Librarian, special - works in libraries maintained by commercial and industrial firms, such as pharmaceutical companies, banks, advertising agencies, professional and trade associations, government agencies, and other types of organizations such as hospitals and museums; plans, acquires, organizes, and catalogs materials, and retrieves information from these resources about subjects of special interest to the organization.

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[1] Ann Roe, The Psychology of Occupations (New York, 1956), p. 146.

[2] Ibid., p. 226.

H. Political scientist - studies the government - what it is what it does, and how and why; is interested in government at every level - local, county, state, regional, national, and international.

I. Sociologist - studies the many groups which man forms - families, tribes, communities, and States, and a great variety of social, religious, political, business, and other organizations which have arisen out of living together.

GROUP II

A. Clergyman, Protestant - leads his congregation in worship services and administers the rites of baptism, confirmation, and Holy Communion; prepares and delivers sermons and gives other talks, instructs people who are received into membership of the church, performs marriages, and conducts funerals; counsels individuals who seek guidance, visits the sick and shut-in, comforts those who are bereaved, and serves church members in many other ways.

B. Home economist, high school teacher - gives courses in food, nutrition, clothing, textiles, child care, family relations, home furnishings and equipment, household economics, and home management; sponsors chapters of Future Homemakers of America, and conducts many related activities.

C. Librarian, public - serves all kinds of readers - children, students, teachers, research workers, and others; provides special materials and services to culturally and educationally deprived people; records and makes information widely available; selects and organizes collections of books, pamphlets, manuscripts, periodicals, clippings, and reports, and assists readers in their use.

D. Librarian, acquisition - purchases books and other library materials recommended by staff members, keeps a well-balanced library in quantity and quality, makes sure that the library receives what is orders, and maintains close contact with book jobbers and publishers.

E. Librarian, cataloger - classifies books under various subjects and otherwise describes them so they may be located through catalogs on cards, or in other forms.

F. Librarian, reference - aids readers in their search for information - answering specific questions or suggesting sources of information.

G. Librarian, school - instructs students in the use of the library and visits classrooms to familiarize students with library materials relating to the subjects being taught; works with teachers and school supervisors who plan the curriculum; prepares lists of printed and audiovisual materials on certain subjects; meets with faculty members to select materials for school programs; and selects, orders, and organizes library materials.

H. Priest - attends the spiritual, moral, and educational needs of the members of his church; offers the Sacrifice of the Mass, hears confessions, administers the Sacraments (including the sacrament of marriage), visits and comforts the sick, conducts funeral services and consoles survivors, counsels those in need of guidance, assists the poor, and gives religious instruction at Mass in the form of a sermon.

I. Rabbi - conducts daily services on the Sabbath and on holidays; prepares and delivers sermons, performs wedding ceremonies, visits the sick, conducts funeral services, comforts the bereaved, helps the poor, supervises religious education programs, engages in interfaith activities, assumes community responsibilities, and counsels individuals.

J. Teacher, kindergarten - conducts a program of education for young children; exposes children to experiences in play, music, artwork, stories, and poetry; and introduces them to science, numbers, language, and social studies.

K. Teacher, elementary - works with one group of pupils during the entire school day, teaching several subjects and supervising various activities, such as lunch and play periods; may teach several groups of children in one or two subjects (in the upper elementary grades).

L. Teacher, secondary - specializes in a particular subject; teaches several classes every day, either in his main subject, in related subjects, or both; develops and corrects tests, keeps records, makes out reports, consults with parents, supervises study halls, and performs other duties; supervises student activities, such as clubs and social affairs.

M. Urban planner - develops comprehensive plans and programs for the overall growth and improvement of urban communities; analyzes alternatives and proposes methods for achieving an efficient and attractive community within the framework of a community's policies and goals; visualizes future conditions in light of the trends in population growth and social and economic change; estimates the community's long-range needs for land, housing, community facilities, transportation, recreation, business, and industry.

GROUP III

Radio or T.V. announcer, broadcasting - presents news and live commercial messages, introduces programs, describes sporting events, acts as master of ceremonies, conducts interviews, and identifies stations; operates the control board, sells time, and writes scripts and news copy (in small stations); acts as disc jockey, introducing selections of recorded music and commenting on the music and other matters of interest to the audience.

Select a film to show the class that portrays duties and pertinent information about General Cultural occupations. Whenever possible, show a film that is representative of several occupations in this Category. A list of suggested films are found in the Appendix. Arrange for four to six students to participate in a panel discussion of the importance of General Cultural occupations in the community, State and Nation. Allow time for the students to prepare for the discussion. Have a resource person who is representative of several occupations speak to the class. For example, invite the school librarian who should be familiar with the different types of library occupations.

WHAT IS THE IMPORTANCE OF OCCUPATIONS IN THE GENERAL CULTURAL CATEGORY?

The General Cultural Category is composed primarily of occupations which in various ways have much influence on the lives of the majority of the population. Some specific examples are given below.

A clergyman serves the spiritual needs of others, leads them in religious activities, and helps or comforts them in time of sorrow and stress. He, by his teachings and through his living example, leads others in formulating their beliefs and practices in relation to their God.

Teaching, the largest profession, employs more than 2.7 million people. This number includes those who are engaged in supporting activities in the educational field such as school administrators, supervisors, consultants, etc. The kindergarten teacher and the elementary teacher who teaches the younger children may often play some parental roles. They are also responsible for seeing that a child has a meaningful and rewarding beginning in his educational experience. This beginning may determine the entire future course of a child's life.

A secondary teacher, too, plays a vital part in determining the direction or future course of a child's life. It is up to him to see that a child remains interested in his school work. To do this the teacher must always be well-prepared for each day's instruction, be enthusiastic about his work, and be able to convince the student of the necessity of being prepared to face his responsibility as a future wage-earner and citizen.

The overall growth and improvement of an urban community are influenced by the plans and programs that have been developed by the urban planner. He estimates a community's long range needs for land, housing, community facilities, transportation, recreation, business, and industry and then goes about getting his estimates and plans changed into realities.

All of the occupations in this Category are of great importance to our society. They are concerned with preserving and transmitting our general cultural heritage.

Arrange for four to six students to participate in a panel discussion on the importance of occupations in this Category.

WHAT IS THE NATURE OF THE WORK IN GENERAL CULTURAL OCCUPATIONS?

As mentioned in the above material, those engaged in occupations in the General Cultural Category are concerned with the preservation and transmission of our general cultural heritage.

A clergyman's title and responsibilities vary according to his religion and beliefs, congregation size, and other factors. Most clergymen lead congregations in worship services and administer the rites of baptism, confirmation, Holy Communion, and marriage. Visiting the sick, conducting funeral services, comforting the bereaved, counseling those in need of guidance, and helping the poor are a few of the other duties of the clergy. Often a religious vocation leads one into home missions' work or even into other countries as a foreign missionary. A paraphrase of a statement made by Hartzell Spence, the son of a Methodist minister and author of the novel One Foot In Heaven, is a good summarization of the nature of work of a clergyman: A clergyman's vocation requires that he be everything from a preacher to a financier; his responsibilities are so numerous that he can never consider his job to be completed. This is one of the most challenging and exacting careers one can enter; but, at the same time, it is one of the most rewarding.

Another challenging yet rewarding field is teaching. "These people are rewarded by prestige deriving from trusted position and opportunity to influence the values of society and promote human growth and achievement."[3] The nature of the work varies from level to level. A kindergarten teacher "exposes children to experiences in play, music, artwork, stories, and poetry; and introduces them to science, numbers, language, and social studies. In a variety of ways, kindergarten teachers help to develop children's curiosity and zeal for learning as well as to stimulate their ability to think."[4] An elementary teacher usually teaches several subjects to one group of students. In some situations, especially in the upper elementary grades, he may teach one subject to several groups of pupils. His primary responsibility is teaching, but he may have other duties such as supervising lunch period and play periods.

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[3] United States Department of Labor, Counselor's Desk Aid (Washington, D.C.), p. 2.

Secondary teachers usually specialize in one subject area and may teach several subjects in this area. For example, a science teacher may teach courses in biological or physical science. He teaches several groups of students a day and may be responsible for supervising a club or clubs, or a study hall. He may work at an athletic or other school event.

A college or university teacher spends approximately from 12 to 15 hours a week in classroom instruction. He also serves as an advisor to students majoring in his particular subject area, and, in most cases, is expected to write articles for educational publications and to engage in research in his subject area. Some college and university instructors teach night classes and extension courses and may be involved in giving correspondence instruction to individuals living away from the campus. Other duties might be sponsoring a club, writing textbooks, etc.

To be successful in his work, a librarian needs to know the type individuals he is to serve. He must evaluate publications, records, etc., and select materials that would be appropriate for his readers. A librarian selects and purchases books, pamphlets, periodicals, magazines, records, films, etc., and assists readers in the use of these materials. He is responsible for classifying and cataloging the materials, publicizing library services, reviewing and summarizing published materials, and preparing bibliographies. The type librarian one is determines responsibilities.

Ask a person engaged in one of the General Cultural occupations to speak to the class about his occupation.

Discuss the occupation of teaching with your students. Characterize the nature of your work. Include such duties as preparing lessons, grading papers, preparing tests, developing visual aids, sponsoring extra-curricular activities, etc.

WHERE IS EMPLOYMENT IN GENERAL CULTURAL OCCUPATIONS FOUND?

Employment for many of these occupations can be found in most cities, towns, villages, and rural areas. A large number of those engaging in these occupations are employed by colleges and universities, and by Federal, State, and local government agencies. A small minority are self-employed. To be more specific, the occupations of teacher, clergyman, historian, and librarian will be discussed.

The level of teaching will determine the locations where job opportunities are available. Elementary schools as a whole have so many vacancies that a position in almost any location can be found by a qualified individual. One-room schools are still in operation in some communities; these provide jobs for approximately 10,000 teachers. More opportunities are available in large urban areas for kindergarten teachers. High schools are not as numerous in some areas as elementary schools, but are usually larger in size. Some counties, especially in Mississippi, have closed smaller high schools and moved the students into a consolidated system which has one large high school. A well-qualified individual can usually find a position in a secondary school in the location in which he lives. During the 1966-67 school year approximately 400,000 instructors were employed in the 2,300 colleges and universities in the United States. Most college instructors are employed by public and private schools, and approximately nine percent are employed by institutions which have less than a four-year educational program. The Occupational Outlook Handbook states that about half of all college and university teachers are employed in eight states – New York, California, Pennsylvania, Illinois, Massachusetts, Texas, Ohio and Michigan.

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[4] United States Department of Labor, Occupational Outlook Handbook (Washington, D.C., 1968-69 ed.), p. 182.

At least one Protestant church is usually found in most areas. Of the 240,000 Protestant ministers, most are associated with the Baptist, Methodist, Lutheran, and Presbyterian churches. Ministers may serve individual congregations, or as missionaries, as chaplains in the Armed Forces, in hospitals and other institutions, or as instructors in colleges and universities. Some are even employed as social workers.

The states of New York, California, Pennsylvania, New Jersey, Illinois, and Massachusetts have the majority of the Jewish population. Therefore, most rabbis serve in these states; however, many serve Jewish people throughout the United States. Rabbis serve in similar capacities as do Protestant clergymen.

Most cities and towns and many rural communities have a Catholic church or churches, but the majority of Catholics are found in the Northeast and Great Lakes regions, California, Texas, Louisiana, and heavily populated areas. Priests, just as rabbis, serve in similar capacities as do the Protestant ministers.

About 85 percent of the historians in our country are employed by colleges and universities. Of the 10,000 persons employed as historians, about ten percent are located in agencies of the Federal Government, primarily in Washington, D. C., serving as archivists, etc. Opportunities for a career as a historian are generally found in locations large enough to have a college, university, museum, or library with adequate facilities for research.

Most librarians work in towns or cities. A large number are employed by elementary and secondary schools, colleges and universities, and governmental agencies. Some librarians work with bookmobile units which provide services to less populated areas.

Have each student prepare a list of persons in the community who are employed in General Cultural occupations. In the list include the name of the organization or institution where the individual is employed and the number of people with whom he works. The students should combine their lists to get an estimate of the number of people in the community who are employed in occupations in this Category.

WHAT ARE THE EDUCATIONAL REQUIREMENTS FOR ENTRY AND ADVANCEMENT IN GENERAL CULTURAL OCCUPATION?

To become a university economist, one is usually required to have his master's degree with a major in economics. A thorough grounding in economic theory, economic history, and methods of economic analysis is necessary if one is to do research in economic theory and formulate ideas that will influence government and industry planning. Many universities are also placing much emphasis on the importance of mathematical methods of economic analysis. A college instructor usually is required to have a master's degree in economics, but to acquire a professorship it is necessary to get a Ph.D. degree. Occasionally, a student of high caliber will be given a graduate assistantship to a college or university to work toward his master's degree. Graduate work should be planned if one is contemplating competing for a responsible position in a particular college or university.

A minimum of a bachelor's degree is required for other Group I occupations. However, others engaged in these occupations may not consider one a professional unless he has completed his master's degree. The occupations of historian and sociologist are examples of these occupations.

Geographers who wish to teach or become involved in research work, or who plan to advance in their field will be required to participate in graduate training.

The Ph. D. degree or its equivalent in training and experience is necessary to become a historian in the Federal Government and in organizations operating on a nonprofit basis.

A lawyer must be admitted to the bar in the State where he plans to set up his law practice. Being admitted to the bar usually involves passing a written examination; some States do not require this of graduates of law schools in the State. Before an individual can qualify for a bar examination in most States, he must complete three years of college and must graduate from a law school approved by the

American Bar Association or the proper State authorities. Training, or study in a law office, will in some States substitute for a part or all of study in a law school. In a number of States the State Board of Examiners has to approve students entering law school, or approve them during the first few years of their legal study. It usually takes seven years after high school to complete the college work and law school work required. Advanced study should be planned if one wishes to specialize in a particular branch of the law or to teach in a law school.

Many high school librarians have received only a bachelor's degree in library science. One planning to teach or aspiring to become an administrator in this occupation will find it advantageous to get his Ph.D. degree. A special librarian should be very knowledgeable of the subject area in which he will be dealing. Some types of librarians have to know at least one foreign language. Usually, school librarians have to be certified by the State where they plan to work.

Jobs such as budget analyst, personnel assistant, or investigator in government or industry are available to those holding only a bachelor's degree in political science. One is usually required to have had some graduate planning before he can become a political scientist. Some government jobs are available only to those who have had substantial experience.

Sociologists may not be considered as professionals by others in their occupation if they hold only the B. S. degree. The master's degree is usually the minimum required for employment as a sociologist. As in most occupations, advancement comes with experience and advanced training. Beginning jobs in the areas of interviewer, research assistant, caseworker, counselor, recreation worker, and administrative assistant in public or private welfare agencies are available to those beginning workers with only a bachelor's degree.

The type educational training one must have to enter the clergy is determined by the religious group with which he is associated. Educational preparations range from no formal education at all to different amounts of training in liberal arts colleges, Bible colleges, or Bible institutes. Many Protestant denominations have begun requiring three years of study in a theological seminary after college graduation. The branch of Judaism determines the requirements for entrance into the occupation of rabbi. One contemplating this occupation must complete a prescribed course of study at a Jewish theological seminary before he can be ordained; this training may range from three to six years. At least eight years' time after graduation from high school is necessary to complete the course of study required to become a priest. After a priest is ordained, he is required by the law of the Catholic Church to continue his training.

Every State requires any individual teaching in the public schools to have a teaching certificate. Most States issue regular teaching certificates only to those who have had four years of college work; some States, about eighteen, require a teacher to have five years of college preparation before he can be certified. There are some exceptions to these requirements. In case of a shortage of qualified teachers, the majority of States will issue temporary certificates to partially qualified teachers. These teachers renew the temporary certificates every year until they have completed all of the requirements for regular certification. Advancement in the teaching profession comes after experience, advanced training, or a move to a new school system.

Those with a bachelor's degree can qualify for entry level jobs in the area of urban planning, but most employers prefer those with a master's degree for professional work in this field. Some jobs in Federal agencies or other government agencies require two years of graduate work in city planning, or its equivalent, to acquire entrance level positions. Civil service examinations are usually given to those aspiring to be urban planners in Federal, State, and local government agencies. The responsibilities for an urban planner are greater and the problems more complex in cities. Moving to a larger city often results in job advancement.

The minimum educational requirement for entry jobs in radio and television broadcasting, Group III occupations, is a high school diploma. In many jobs college training is preferred by the employers.

"Competition for announcing jobs in the national networks is intense, and an announcer usually must be a college graduate with several years of successful announcing experience before he will be given an audition."[5] Correct English usage is an important quality one needs to possess if he is considering entering this occupation.

Have students choose a particular occupation from the list given in preceding pages and write a paragraph on the educational requirements for entering and advancing in the occupation. Allow the students time to do some research to gather the information they need. This may be used as a homework assignment. Give the students examples of sources where this information can be found.

WHAT ARE THE EARNINGS AND FRINGE BENEFITS IN GENERAL CULTURAL OCCUPATIONS?

Earnings of Group I occupations in this Category range from approximately $5,500 to $27,000 and up.

In 1966 the average salary of a university economist was $11,750. Many economists supplement their salary with earnings obtained by acting as consultants, by writing articles or books, and by speaking to organizations, etc.

An urban geographer with a bachelor's degree and no experience will usually have a beginning salary of $5,331 to $6,451. With one or two years of graduate work and no experience he may earn a beginning salary of approximately $6,451 to $7,696. With additional educational training and with experience, his earnings may exceed $15,000.

The political geographer has a beginning salary that is comparable to that of the urban geographer. However, his maximum earnings are slightly less, usually about $12,000.

With experience a Federal Government historian may receive $15,000 or more a year. However, starting salary with the Federal Government is around $5,331. Statistics indicate that the average salary in 1966 of college and university historians was $12,600.

Lawyers' earnings vary considerably. Beginning lawyers employed by the Federal Government may start at $6,451 or $7,696, depending on their personal qualities. An attorney in a private industry may earn as much as or more than $27,000 a year.

Several factors, such as the training and experience of an individual, the technical skill necessary to do the job, the responsibility of the position, and the geographical location, size, and type of library, determine the salary of a librarian. In 1966 the average beginning salary for a graduate of a library ool was $6,700. A secondary school librarian's salary is determined by the school system in which is employed; probably, it would range from $4,500 to $9,000. Specialists may earn $15,000 or more, and supervisory and administrative positions may pay up to $17,550.

Political scientists may supplement their salaries, which usually range from $5,000 to $16,000, by teaching in the summer or by doing consulting work. College and university political science instructors earn on an average approximately $12,600 a year. Many college professors of political science earn $16,000.

From $5,000 to $15,000 is the usual salary range that may be anticipated by one who plans to become a sociologist.

The salary of a Protestant minister or of a rabbi is determined by the resources possessed by the congregation he serves. Some Protestant ministers in large churches earn $20,000 or more, while ministers in smaller churches earn occasionally less than $3,500. Gifts received and fees from ceremonies performed supplement these salaries. All of the living expenses of a priest are provided.

Kindergarten and elementary school teachers make from $4,000 to $8,000 a year depending on the school system of which they are faculty members. Secondary or high school teachers have salaries of $4,000 to $8,000. Some States – California and New York, for example – have a teaching salary scale that exceeds other States. Mississippi, Arkansas, and South Dakota have some of the lower salary scales. A few secondary school teachers supplement their salaries by teaching adult extension and other types of classes.

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[5] United States Department of Labor, Occupational Outlook Handbook (Washington, D.C., 1968-69 ed.), p. 672.

An experienced urban planner without a master's degree makes on the average about $6,500. With a master's degree this could increase to as much as $9,000 or more. Planning directors in small cities earn approximately $10,000 while those in large cities often make $22,000 a year.

The size of the broadcasting station and the length of time it has been established are vital factors in determining the earnings of a radio or television announcer. Earnings in television stations tend to be higher than radio. Salaries may range from $3,900 a year in small communities to $15,000 a year in large, well-established, local radio stations. There are a few well-known national television announcers who earn $50,000 or more a year. Announcers may receive fees from advertisers in addition to their salary.

Fringe benefits in many of these occupations are similar to those of occupations in other categories. Some of these are: paid holidays, vacations with pay, pension and retirement plans, sick leave, group insurance policies, and others. Teachers are usually employed on a nine-month's contract and have three months off in the summer to spend as they wish. However, some teachers are employed on a twelve-month basis. These teachers may be given a month's vacation in the summer or may be given time off to acquire additional educational training. There are some fringe benefits that are peculiar to certain occupations. For example, a clergyman is usually given rent-free housing, and, in some situations, his utilities and various other bills are paid.

Numerous factors determine the earnings and fringe benefits of an occupation.

Choose one member of the class to interview the school superintendent regarding the earnings and fringe benefits found in the teaching occupation. If possible, he should secure a copy of the salary scale which is used to determine the salaries of teachers in the school system. Have him report to the class the information acquired from the interview.

WHAT IS THE EMPLOYMENT OUTLOOK FOR OCCUPATIONS IN THE GENERAL CULTURAL CATEGORY?

Employment opportunities will steadily increase in the majority of occupations in the General Cultural Category. In some occupations the increase will be moderate, while in others it will be more rapid. Many employees will be needed to fill positions which become vacant as a result of deaths, retirements, and transfers to other fields of work.

Demand for economists in colleges and universities will increase rapidly during the next decade because of anticipated increasing enrollments.

Political and urban geographers will find an increase in employment in government agencies. Even though geography is a small field, well-qualified geographers should have no difficulty in finding employment in the 1970's.

The 1970's should show a rapid increase in the employment opportunities for historians. History teachers and archivists will have the greatest opportunities, but there is a slight increase in positions for other types of historians. Educational preparation will determine the types of positions open to one. Positions as professional historians will be very difficult to locate for those with only a bachelor's degree.

The quality of the law school and the scholastic rating of the individual will greatly influence a lawyer's prospects during the 1970's. Those with higher scholastic ratings and from widely recognized schools of law will obtain, with less difficulty, positions carrying a good salary. A slight decline in the number of lawyers going into private practice may occur.

Opportunities for employment in library science will be favorable during the next few years. Excellent job openings will be available to those who are well-qualified. Some of the best employment opportunities will be located in college and university libraries, school libraries, and special libraries.

Political scientists will find the largest growth in employment opportunities to be in colleges and universities. However, the amount of education one has will affect his chances of securing certain positions. There will not be a very large growth of job openings for political scientists in private industries.

Job openings for sociologists will be greatest in institutions of higher learning. More jobs will be available to those who have had training in methods of research and advanced statistics. Without a master's degree and experience or a doctor's degree, one will find keen competition in securing employment as a professional sociologist.

Since there is an expected growth in the population and in the number of church congregations, there will continue to be a demand for clergymen. Many Protestant, Catholic, and Jewish congregations have not been able to secure a full-time ordained clergyman to guide them in their religious training.

During the past few years there has been an increase in the number of individuals who have entered the teaching field. For this reason the demand for teachers has lessened somewhat and schools have begun to place more emphasis on a potential teacher's educational training and his scholastic achievement. New graduates may find competition to be greater, but the well-qualified teacher can usually find a teaching position. Until 1975 one will find many teaching positions available.

The employment outlook for urban planners during the next decade is expected to be very good. As in most occupations, the well-qualified person will have less trouble securing employment.

There will be a moderate increase in the jobs available to radio and television announcers during the next ten years. Jobs will be more numerous in the radio industry because of the larger number of radio stations. Automatic programming will be used more widely, thus cutting down on the number of jobs that will become available. Competition will be great in this field because of the attraction it has for young people.

Ask the guidance counselor to speak to the class on the employment outlook for occupations in this Category. Ask him to emphasize the importance of educational training and scholastic achievement for those wishing to enter General Cultural occupations.

WHAT IS THE RELATIONSHIP BETWEEN SUBJECTS TAKEN IN SCHOOL AND OCCUPATIONS IN THE GENERAL CULTURAL CATEGORY?

One interested in becoming a university economist will find that high school courses in mathematics and in the social sciences, such as economics, will be very helpful when he starts preparing for a career in this field.

A student contemplating a career as an urban geographer or as a political geographer should take a course in geography if his high school offers one.

As many history courses as possible should be taken by one who plans to be a historian. Courses in English and, if possible, journalism would be helpful in preparation for the job of writing about past events.

The following high school courses would be helpful to one planning to become a lawyer: English, history, economics, government, and speech. Some types of lawyers, such as the patent attorney, would find science courses to be valuable.

Almost all of the courses in the secondary school would be of some value to one contemplating a career as a librarian. Of special significance would be courses in English, literature, social science, and biological science.

The high school subject of primary importance to one considering entering the occupation of political scientist is government. "Political science is the study of government - what it is, what it does, and how and why."[6]

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[6] United States Department of Labor, Occupational Outlook Handbook (Washington, D.C., 1968-69 ed.),p. 178.

A background in high school social studies would be an excellent beginning for one contemplating a career as a sociologist.

An individual who is considering becoming a clergyman will profit from such high school courses as English, history, foreign language, and the social sciences.

Any courses in high school relating to the specific subject area that one plans to teach would be valuable to him. Since an elementary teacher usually teaches several subjects, English, mathematics, social studies, etc., most of his high school courses would be helpful. If one plans to be a science teacher, he should take as many science courses as possible. The preceding factor would apply to any type teaching area.

One anticipating becoming an urban planner would profit from the following high school courses: English, speech, and the social sciences.

A successful radio or television announcer must be able to pronounce words correctly and enunciate them clearly; he must also have a good command of the English language. Therefore, high school courses in English, speech, and dramatics would be worthwhile for one interested in these occupations. A background in foreign languages, physical education, and music would be helpful since much of the work of announcers, especially those in radio, involve these areas.

Have a student, with the help of his classmates, list on the chalkboard all courses offered by your school that might apply directly to General Cultural occupations.

Each student should choose an occupation from this Category and plan a high school curriculum which would be valuable to him in preparing for entry into the occupation. Have him distinguish between courses that relate directly to the occupation and those that would be classified as general education courses.

PHASE II: TRANSITION

During Phase I of the section, each student was asked to compare his personal characteristics, interests, aptitudes, and achievements with those needed to enter an occupation in this Category. He also participated in classroom related activities related to the General Cultural Category. These activities should have prepared each student for tentatively selecting and exploring one or more occupations.

Have each student select an occupation from those listed at the beginning of this section. If, during the course of his individual exploration, a student decides that he wishes to change to another occupation, he should check with you and explain the reason for his change.

NOTE: Remind the student that he is to compare his personal characteristics, interests, aptitudes, and achievements with those that are required for successful entrance and advancement in the particular occupation he chooses. Review the section in the Teacher's Handbook which explains how individual exploration of occupations should proceed.

PHASE III: INDIVIDUAL EXPLORATION

Provide the students with specific occupational information such as phamphlets and booklets, filmstrips, etc. (see Appendix for a list of suggested materials) and with general occupational information materials such as the Occupational Outlook Handbook, Dictionary of Occupational Titles, Encyclopedia of Careers, etc. This is the beginning of several phases of individual exploration that will carry the student through realistic and meaningful experiences related to the occupation in question. All materials needed should be readily available. Make sure that each student understands completely how to use the materials.

Review the Teacher's Handbook for information on how the students may get maximum benefit from exploration of printed material, use of filmstrips and tapes, suggested resources, etc.

Have each student complete an occupational study form as he explores an occupation. See Appendix B for suggested occupational study form to be utilized.

A check sheet or progress chart should be divised for use in keeping a record on each student as he engages in the individual exploration periods. A student should inform the teacher if he wishes to change direction and begin exploring another occupation.

A brief oral report about the occupation explored should be assigned to each student. Allow time for other students to ask questions pertaining to each report.

After completing this phase of individual exploration, each student is to be provided with directions for doing one or more activities pertaining to the occupation he has chosen to explore in depth, and provided with a place to conduct such activities. Make certain all materials needed are available.

Review the section in the Teacher's Handbook pertaining to the use of simulated learning activities, the roles of the teacher and of the student in these activities, etc. See the suggested activities at the end of this unit.

Allow each student sufficient time to complete his activity or activities. Get his reaction to the type of work one does in the occupation he has explored.

SUGGESTED ACTIVITIES

Plan activities which will be valuable to the students in exploring the various occupations in the General Cultural Category. The following are only a few of the many activities which can be utilized in making this exploration of occupations meaningful:

Religious Occupations

Priest

Rabbi

Protestant minister

A. Arrange for an interview with a clergyman of your specific religious faith. Tell him of your decision to study the clergy and ask for his help in evaluating your qualifications for the profession. Seek his counsel often.

B. Become familiar with the basic beliefs of your religion and other religions. Ask your minister, priest, or rabbi to help you acquire the information you will need for this study.

C. Become more active in your church work. Ask your clergyman to give you some responsible church duties to perform.

D. Go with your clergyman to visit a sick person or a shut-in.

E. Prepare and give a devotional over your school's intercom, if the school has devotionals.

Library Science Occupations

Acquisition librarian
Cataloger librarian
College librarian
Public librarian

Reference librarian
School librarian
Special librarian

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A. Arrange for an interview with a person in the specific occupation in which you have an interest. Prior to the interview, prepare a list of questions you would like to have answered during the interview, such as his duties and how he became interested in his occupation. Present the list of questions to your teacher for approval. Read any information you can find on interviewing techniques, proper dress for an interview, etc.

B. Memorize the major divisions of the Dewey Decimal System. The school librarian or the English teacher can provide you with this information.

C. Ask the school librarian to explain the use of the card catalog, and then study its "makeup" carefully.

D. Become familiar with the content, function, and use of the Reader's Guide to Periodical Literature. The librarian or English teacher can assist you in this activity.

E. Learn the meaning of all the coding put on a book by the school librarian.

F. Prepare a bibliography of all the reference materials in the occupational orientation classroom relating to the occupation of librarian. Refer to your English textbook for the correct procedure to use in preparing a bibliography.

G. Interview your school librarian to find the procedure followed to order books. Secure an order form and practice filling it in.

H. Using 3 X 5 inch cards, prepare several examples of cards with titles and any codes (Dewey Decimal System Code, Library of Congress numbers, etc.) which are used in the card catalog. File these in proper sequence in a small box. Ask the librarian to check your work for accuracy.

Social Science Occupations

Historian
Political geographer
Political scientist
Sociologist
University economist
Urban geographer

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to "A" under Library Science Occupations for procedure.)

B. Activities for a student interested in becoming a historian:
1. Prepare a paper describing the influence of the Smith-Hughes Act on the development of vocational education.
2. Trace the genealogy of your family for as many generations as possible. Include names, dates of birth and death, etc.

C. Activities for a student interested in becoming a political geographer:
1. Draw, on a piece of posterboard, a diagram illustrating the political organization of your county government. Be prepared to explain the diagram to your classmates. The government teacher in your high school should be able to help you with this project or give you suggestions as to where you may get such assistance.

2. Sketch the State map including county boundary lines. Obtain a record of which counties voted for certain candidates in the last governor's election. (This information can usually be gotten from the local newspaper office.) Indicate on the map by writing inside the county boundary lines the last name of the candidate who "carried" each county. A different color might be used for each candidate.

D. Activities for a student interested in becoming a political scientist:
   1. Prepare a paper comparing the government of the United States with that of the Soviet Union. Using the information in your paper, give a five-minute talk to your classmates on your comparison study.
   2. Conduct an opinion poll on whether the President of the United States should continue to be elected by the electoral college or be elected by popular vote (majority vote of the population). Prepare an interview sheet and present it to your teacher for approval. Interview approximately twenty-five people in your town. (Be sure to explain to them the purpose of your interview.) Compile your information and report your findings to the class.

E. Activities for a student interested in becoming a sociologist:
   1. Prepare a paper on the origin, development, purpose, functions, etc. of your county welfare department. Give a three-minute speech to your classmates summarizing your paper.
   2. Observe one of the leaders in your school and try to determine why he is a leader. Note how his behavior influences group behavior. Ask individual students to state the characteristics this person (leader) has which make him a leader. Write a paper summarizing your study.

F. Activities for a student interested in becoming a university economist:
   1. Become familiar with the meaning of the term "gross national product" (GNP) and its importance to an economist. Prepare a graph on posterboard to illustrate the rise in our GNP. Explain the graph to your classmates.
   2. Become familiar with the "law of supply and demand" and the "law of diminishing returns." Explain these laws to your classmates by illustrating each on the chalkboard or by other means.

G. Activities for a student interested in becoming an urban geographer:
   1. Plan and develop a sketch of a shopping center which would fit the needs of your city, town, or community. Take a survey to determine the types of business that should be located in the center. Interview about twenty-five citizens to get their reactions as to the types of business needed.
   2. Obtain a map of your community, town, or city, or of one nearby. Using colored pencils or crayons, color the residential sections blue, the business districts red, and the industrial districts green. Display the map on the bulletin board in your classroom.

Teaching Occupations

Elementary teacher
Home economist, high school teacher
Kindergarten teacher
Secondary teacher

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to "A" under Library Science Occupations.)

B. After choosing a particular topic which relates to your selected teaching area (for example, "Gross National Product" for an economics teacher; "Parts of a Business Letter" for a typewriting teacher; "The Color Wheel" for a home economics teacher; "Basic Addition" for an elementary teacher, etc.) prepare a fifteen-minute teaching plan. You will be given the time needed to present or teach the topic to your classmates. Begin the class by checking the role as your teachers do each day.

C. Prepare a short examination (about five questions) that will test your classmates' comprehension of the topic you taught. Grade the test and return it to your "students."

D. Attend a PTA meeting with your parents.

Other Occupations

Lawyer	Urban planner
Radio and television announcer	

A. Arrange for an interview with a person in the specific occupation in which you have an interest. (Refer to "A" under Library Science Occupations.)

B. Activities for a student interested in becoming a lawyer:

1. Prepare a will for yourself. The business teacher in your school should be able to supply you with a book which illustrates a will. Business law books will usually have such an illustration. Present the finished copy of your will to the occupational orientation and business teachers for their approval.
2. Prepare a report on the laws relating to the issuance of "bad checks." In the report include the following information: circumstances existing when the issuance of "bad checks" is not a crime, the criminal liability, how a notice of dishonor is presented, punishment for issuance of "bad checks," etc.
3. Visit a courtroom and observe a court proceeding.
4. Give an oral presentation on the functions of a state supreme court, a county, circuit, superior, or district court, and a justice of the peace court.
5. Give an oral presentation telling how a case is tried in a courtroom.

C. Activities for a student interested in becoming a radio or television announcer:

1. Prepare a five-minute script giving the purpose, methods used in teaching, and other pertinent information regarding occupational orientation. With the school's intercom system on only in your classroom, present the script to your classmates.
2. Choose a product and perpare a one-minute commercial for it. Present the commercial to your teacher for approval. Give the commercial in front of your classmates and then ask their constructive criticism.

D. Activity for a student interested in becoming an urban planner: Develop a plan which you think would be an ideal layout for a new town with an estimated population of 10,000 people. Show main streets, schools, downtown business district, housing developments, power plants, highways, shopping centers, churches, etc. on your plan. Present your layout to the teacher and to several classmates for their advice and evaluation.

EVALUATION

Student learning should be evaluated in terms of behavioral change - an evidence of growth.

Refer to the "pretest" given at the beginning of this unit when evaluating the student's behavioral change which occurs as a result of the activity or activities he completes.

Prepare an evaluation questionnaire to give to each student as he completes this unit. (See Appendix C for a sample questionnaire.)

PHASE IV: EDUCATIONAL PLANNING AND PROJECTION

After the student has completed his individual exploration of an occupation, have him examine college catalogs to discover where he may get the specific training or education necessary for successful entrance and advancement in the occupation he chose. Discuss the relationship between certain high school courses and college entrance requirements. Point out licensing and certification requirements for lawyers, teachers, etc. Reemphasize the need for completing high school and for additional training.

UNIT 9

ARTS AND ENTERTAINMENT

PRELIMINARY DRAFT

Prepared by the
CURRICULUM COORDINATING UNIT
for
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MISSISSIPPI STATE UNIVERSITY
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ARTS AND ENTERTAINMENT CATEGORY

STUDENT OBJECTIVES

1. To be prepared to write a brief definition of the term "Arts and Entertainment," and to list at least five occupations that are included in the Arts and Entertainment Category.

2. To study carefully the content of this manual in order to be able to tentatively select one or more occupations for detailed study.

3. To become involved in at least one realistic experience pertaining to each of the occupations tentatively chosen.

4. To be able to list several occupations in the Arts and Entertainment Category that you liked the most, and to write at least one reason why you found each interesting.

5. To be able to identify several occupations that you like the least, and to write at least one reason why you dislike these occupations.

6. To be able to identify and list your special interests that would help in meeting requirements for success in occupations in the Arts and Entertainment Category.

7. To be able to identify and list your special abilities that would help in meeting requirements for success in occupations in the Arts and Entertainment Category.

8. To be able to identify personal limitations that may prevent success and satisfaction in occupations in the Arts and Entertainment Category.

TEACHER OBJECTIVES

1. To spend as much time as necessary to prepare students for the Arts and Entertainment Category by reviewing test interpretations and keys to self-understanding, and by dealing individually and as a group with problems that may have arisen.

2. To identify what the students know about Arts and Entertainment occupations before beginning the unit by giving a short test.

3. To define the term "Arts and Entertainment" and to characterize it by using illustrations and examples.

4. To acquaint students with Arts and Entertainment occupations by duplicating a printed list with short explanations, and passing these to the students for study and reference.

5. To show the students, on a screen or by duplicating and passing out printed lists, how occupations can be grouped according to amount of education, skills, and responsibility.

6. To show the students how occupations in the Arts and Entertainment Category can be grouped by industries, families, and units of economic activity; to compare these occupations with each other.

7. To involve the students with in–class and out–of–class activities that will help them see the evidence and importance of Arts and Entertainment occupations within their community.

8. To lead the students in a brief study of the nature of the work in Arts and Entertainment occupations, where employment is found, education and skills required for entry and advancement (in these occupations), earnings, trends, and employment outlooks.
9. To lead the students in the study of typical personal requirements to be successfully employed in these occupations; to involve students in activities that will aid them in measuring their own personal traits and abilities in relation to these requirements.
10. To provide the opportunity for students to choose one or more occupations in the Arts and Entertainment Category and make a detailed study of it through the use of filmstrips, films, occupational briefs, career books, etc.
11. To provide students with any educational and occupational information needed to intelligently plan a career choice.

PHASE I: AN OVERVIEW

WHAT IS MEANT BY THE TERM "ARTS AND ENTERTAINMENT" AS APPLIED TO THE OCCUPATIONS TO BE STUDIED IN THIS CATEGORY?

This term is applied to occupations in which the nature of the work concerns performing special skills in the creative arts and in the field of entertainment. The term includes the musical, painting, and dancing arts, and such entertainment occupations as professional athletics and acting.

WHAT ARE THE OCCUPATIONS IN THE ARTS AND ENTERTAINMENT CATEGORY? HOW ARE THEY CLASSIFIED?

GROUP I

A. Architect – Plans and designs private homes, office buildings, hospitals, schools, factories, and other structures; organizes materials and equipment necessary to meet specifications; talks with the customers and plans layout and cost of the structure; prepares sketches, drawings, and specifications for the building contractor and construction workers.

GROUP II

A. Account executive, advertising – Handles relations between an advertising agency and its clients; develops an advertising campaign and applies the program to the client's needs.

B. Athletic coach – Analyzes the performances of players and instructs them in areas of weakness to develop teams for sports competition; demonstrates the techniques of the game to the players in order to improve their skills.

C. Actor – Rehearses lines and actions in portraying various characters; presents characterization to audience using gestures, speech, song, and dance.

D. Actress – (See Actor)

E. Art director – Supervises, directs, and participates in motion picture art work related to the design of sets, scenic effects, and costumes.

F. Dancer – Rehearses and performs classical, modern, or acrobatic dances, alone or with a partner or groups, to entertain people; times body movements and facial expressions to express the theme of the dance.

G. Designer, industrial – Designs many products such as furniture, lamps, cars, household appliances, and aircraft; takes into consideration price, appearance, customer wants and needs, and methods of production; supervises the development of design sketches into working drawings, specifications, and models.

H. Designer, apparel – Creates original designs for new types and styles of men's suits, women's dresses, and other apparel.

I. Musician, instrumental – Plays one or more musical instruments alone, or with others, by reading music or from memory; manipulates keys, valves, strings or percussion devices, depending upon the type instrument being played.

J. Research director, advertising – Directs workers engaged in preparation of advertising and publicity programs and materials; processes and analyzes information gathered by assistants.

K. Singer – Gives expression to harmony, melody, and rhythm of music by means of voice.

L. Teacher, music – Teaches individuals or groups instrumental or voice music in a public or private school.

M. Teacher, art – Instructs pupils in art, such as painting, sketching, designing, and sculpturing; demonstrates methods and procedures to pupils, and observes pupils to make criticisms and corrections.

GROUP III

A. Artist, advertising (display artist) – Draws, paints, or sketches backgrounds and other fixtures made of paper, cardboard, wallboard, plaster, canvas, or wood used in exterior or interior displays.

B. Copywriter, advertising – Consults with the account executive, newspaper, radio, and television representatives, and marketing representatives about a product or service that is to be advertised; writes original advertisement copy for newspapers, magazines, and billboards; writes scripts for radio and television advertising.

C. Decorator-designer, interior – Designs and plans artistic interior furniture, lighting fixtures, pictures, draperies, and walls of homes, hotels, ships, hospitals, and other establishments; directs workers painting walls, laying carpets, arranging furniture, etc.

D. Layout man, advertising – Designs layouts for newspaper, magazine, television, poster, direct mail, and billboard advertisements; uses sketches, illustrations, and photographs provided by the customer to develop the layout.

E. Photographer, commercial – Photographs persons, merchandise, buildings, machinery, and fashions to be used in advertising and selling; loads film in a camera, adjusts camera for proper distance, angle, and focus to get acceptable photographs; develops prints using a chemical solution.

F. Model – Models garments such as dresses, coats, underclothing, swimwear, and suits for garment designers, buyers, sales personnel, and customers.

G. Professional athlete – Engages in one sport such as football, basketball, baseball, tennis, golf, and track as a means of livelihood.

GROUP IV

A. Delineator-renderer – Makes artistic drawings, as they would appear to the eye, of buildings and manufactured products for display or advertising purposes; works from sketches and blueprints, using pencils, pen, charcoal, water colors, or an airbrush.

B. Letterer – Paints or draws precise lettering to be reproduced in books, advertisements, and other printed materials; works from sketches and instructions, using a lettering pen and brush.

C. Paste-up man – Photographs prepared advertisement copy, develops photographic negatives, and arranges and mounts illustrations and printed legends on paper according to an artist's layout; uses a ruler, drafting instruments, scissors and a knife to arrange, cut, and fit materials.

D. Floral designer – Designs and fashions natural and artificial flowers and foliage; uses wires, pins, and tape to arrange and fit corsages, sprays, wreaths, centerpieces, and other designs for weddings, balls, dances, church services, and funerals.

GROUP V
No occupations

GROUP VI
No occupations

HOW CAN THESE OCCUPATIONS BE CLUSTERED?

Several of the occupations in this Category can be clustered within an organization or unit of economic activity in which they exist. Such classification will help show relationships to other occupations and possible entrance and advancement possibilities. Also, occupations are more meaningful when viewed as a cluster of occupations having commonalities other than the interest focus.

A. Advertising
  Group II
    1. Account executive
    2. Research director

  Group III
    1. Advertising artist
    2. Advertising copywriter
    3. Advertising layout man
    4. Photographer, commercial

Group IV
   1. Paste-up man
   2. Letterer
   3. Delineator-renderer

B. Performing Arts
   Group II
      1. Actor
      2. Actress
      3. Art director
      4. Dancer
      5. Instrumental musician
      6. Music teacher
      7. Singer

C. Design and Planning
   Group I
      Architect

   Group II
      Industrial designer

   Group III
      Interior decorator-designer

D. Apparel Industry
   Group II
      Apparel designer

   Group III
      Model, fashion

E. Sports
   Group II
      1. Athletic director
      2. Athletic coach

   Group III
      Professional athletes

Identify several occupations in the creative arts that require high degrees of skill. Point out several occupations that require high degrees of responsibility. Identify personal characteristics necessary to be successful in such work.

Have students discuss special talents and personal characteristics they possess that relate to Arts and Entertainment. Have students relate these talents by performing before the class. Have students tell of past performance experiences.

Select and show the class at least one film that portays duties and responsibilities and other pertinent information about several Arts and Entertainment occupations. Some films from which to select are listed in the bibliography.

Arrange for about six students to participate in a panel discussion of the importance of Arts and Entertainment occupations in the community, state, and the nation. Allow time for the panel to do some research before the presentation.

Arrange for resource persons to speak to the class. The school art teacher, music teacher, drama teacher, and athletic coaches would make excellent resource persons.

Involve a committee of several students in developing study displays of the Arts and Entertainment occupations. These displays should be developed according to the groups or clusters of occupations. Whenever possible, actual items, such as game balls, musical instruments, and paintings should be used to characterize the nature of the work. Pictures and other illustrations may be cut out and mounted on a background. Large letters may be used to capture attention of other students, with smaller letters used for detailed information.

Have students collect information from want ads in the newspaper about Arts and Entertainment job opportunities.

Determine which students have parents engaged in Arts and Entertainment occupations, either part-time or full-time.

Have students find appropriate articles concerning Arts and Entertainment occupations. Let students report on these. File the articles for use with future classes.

Have students interview people who are working in Arts and Entertainment occupations. Arrange for these to be taped and replayed in class. The instructor may add value to these by getting some action shots on slides, illustrating the job being discussed.

WHAT IS THE IMPORTANCE OF OCCUPATIONS IN THE ARTS AND ENTERTAINMENT CATEGORY?

ADVERTISING

America's free enterprise system promotes competition. One result is more products and services available to the people. Moreover, as the country becomes more affluent and our population increases, people are demanding more goods and services. Only mass selling can distribute such a wide range of products and services to so many people. Advertising is the means that sellers use to interest buyers and customers. This is done through various media: store fronts and windows, newspapers and magazines, radio and television, direct mail, and outdoor advertising.

The group of advertising workers included in this category is principally responsible for the creative visual aspects of advertising. We see the end product of their work in the media that were mentioned above.

There are approximately 250,000 people employed in all types of advertising work.

PERFORMING ARTS

Occupations listed in this cluster enable us to spend many pleasurable hours viewing performing artists, either in person or on television, and listening to them by way of radio and phonograph.

In 1967 there were approximately 24,000 dancers and dancing teachers, 18,000 actors and actresses, 162,000 musicians and music teachers, and 59,000 singers and singing teachers. There are presently too many workers in these occupations. Consequently, many work part-time in these occupations, and work in other occupations as a principal means of livelihood.

DESIGN AND PLANNING

Workers in this group are important because they apply their talents and skills in improving the appearance and functional design of our physical surroundings, including buildings and consumer products.

In 1967 there were 10,000 industrial designers, 32,000 licensed architects, and 15,000 interior decorator-designers.

APPAREL

Few people make their own clothing or that of their families, as was the case fifty years ago. Ready-made dresses are now produced in mass quantities and in many styles. The American people demand more clothing in many styles for every season of the year. Fewer than 20,000 designers create designs for almost anything which is part of the clothing of men, women, and children.

Increasing numbers of models are needed to display the many styles of clothing in style shows, in photographs in newspapers and magazines, and on posters and television.

SPORTS

Sports events, which involve one player or teams of players, provide a means for Americans to relax while watching others perform. The sports world is a vital element in our society. Many people have been brought from the ranks of the depressed to fame and glory as a result of participation in sports. Many minds have been molded and enhanced toward better citizenship as a result of the discipline required in sports competition. Many professional players have advanced to positions in the motion picture industry, radio, and television, and several have been elected to political offices. Many are presently employed as professional athletes, athletic coaches, and athletic directors.

WHAT IS THE NATURE OF THE WORK IN ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

People engaged in the advertising occupations listed in this Category plan and prepare advertisements for such products as cars, stoves, refrigerators, clothing, and office equipment. They also plan and prepare advertisements characterizing services rendered by businesses such as insurance companies, restaurants, gas stations, and banks. These workers include researchers who determine customer needs and wants and what advertisements appeal to customer needs and wants, copywriters who write the text of the advertisements, artists who prepare the illustrations, and layout specialists who put copy and illustrations into the most attractive arrangement possible.

PERFORMING ARTS

This type work requires extensive practice. Actors, actresses, musicians, and dancers may be required to travel a great deal. It is usually hard and demanding work that requires special talent and involves many difficulties and uncertainties. Due to competition, only a small number of those engaged in such occupations achieve recognition as stars. This is particularly true of actors and actresses. Many struggle for a toehold in the profession.

DESIGN AND PLANNING

The creative work of the architect, industrial designer, interior designer and decorator, and the renderer aids in enhancing the attractiveness of homes and other products. They spend much time doing historical research, as well as contemporary information gathering. They consult with the customer and make preliminary sketches of the product in question. They work with cost estimates, materials to be used, and other factors of design.

SPORTS

Sports careers are not easy. In most sports activities a great deal of energy must be expended by the participants. Much practice and discipline are required before the actual events are conducted for spectators. Most sports are played on the weekends and on holidays when most everyone else is resting and relaxing.

The athletic coach must not only know the game, but be able to demonstrate the game to the players. The athletic director must have a broad knowledge of several sports and will be required to provide leadership in establishing a program of athletics for the institution and the community. Players, as well as coaches and directors, work with people and usually make many friends wherever they go.

MODEL

Models could easily be classified with those in advertising occupations. They are important to garment buyers and department stores in displaying new styles. The American garment industry has assumed world leadership in the production of clothing. Increasing numbers of models are needed to display the garments. At certain peaks of the fashion year a model may be on duty constantly in the showroom. During "slow" seasons, the model may act as a receptionist, do routine filing, and answer the telephone. Department store models may have regularly scheduled style shows. Many models work part-time for special shows, or for a certain buyer's showings.

APPAREL DESIGNER

The apparel designer plans how garments are to be cut for factory production. He must understand the methods of production so that the garment can be efficiently produced. He must meet with retail buyers to determine the consumer trends. Designers of women's garments may travel to England, France, and other countries to observe styles.

WHERE IS EMPLOYMENT FOUND IN ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

Employment in advertising occupations listed in this Category is found primarily in advertising agencies, manufacturing companies, stores, and other organizations having products or services to sell. Many are employed by newspaper and magazine publishers, and printers and art studios.

PERFORMING ARTS

Most actors and actresses are employed by stage and motion picture companies. Some are employed by "live" radio and television. The location of employment may depend upon the season of the year, and whether the work is with motion picture filming or on the stage. In the winter, most employment opportunities on the stage are in New York. Stage actors may perform in resort theaters, or in community theaters throughout the nation. Employment opportunities in motion pictures and television are centered in Hollywood, New York, Miami, and other parts of the country.

Dancing teachers are employed in schools of dance and in schools and colleges located principally in large cities. Most dancers are performers on the stage, screen, and television. New York City, Los Angeles, San Francisco, Chicago, and Miami are the locations for most employment opportunities for dancers.

Most professional musicians and singers perform in New York, Chicago, and Los Angeles. Music teachers and singing teachers are employed in elementary and secondary schools, as well as in colleges and universities all over the country.

DESIGN AND PLANNING

About two–fifths of the 32,000 registered architects are self–employed, practicing individually or with partners. Most of the others work for architectural firms with large construction programs. Some are employed by government agencies in such fields as community planning and urban redevelopment. A few teach in schools of architecture.

Most interior decorator-designers are employed with large department and furniture stores located in large cities. Some are employed with hotel and restaurant chains. Others are employed by architects, antique dealers, office furniture stores, industrial designers, furniture and textile manufacturers, or by periodicals that feature articles on home furnishings.

Most of the 10,000 industrial designers are employed by large manufacturing companies and by design–consulting firms. Some do free-lance work. A few work for architects.

SPORTS

Most professional athletes are employed by leagues or other organizations. Most work in and around large cities, traveling to and from these metropolitan areas to perform before audiences.

Most athletic coaches and directors are employed in schools, colleges, universities, and other institutions.

APPAREL

Women's styles change often and most of their apparel is designed by women. The major center of employment for designers is New York. Most fashion models are women. They are employed by large department stores and in other places where there are apparel showrooms. The designer in men's wear usually works closely with the factory producing the garment. The field of male modeling is highly competitive and difficult to enter.

WHAT ARE THE EDUCATIONAL REQUIREMENTS FOR ENTRY AND ADVANCEMENT IN ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

Most employers hiring advertising trainees prefer college graduates with liberal arts training, or majors in marketing, journalism, or business administration. However, many have been successful without such an educational background.

High school students planning to enter the advertising field should get experience by working for the school newspaper, annual, or other publications. Experience may be acquired through part-time jobs in selling, or by enrolling in the distributive education classes. Many advertising companies recruit outstanding graduates and train them on the job. Many young people begin their careers in advertising by beginning as mail clerks, messengers and runners, assistants on research or production work, and junior copywriters. Others begin as secretaries and in advertising departments in retail stores.

Preparatory courses in high school for advertising careers would consist of English, literature, social studies, sociology, psychology, and economics.

PERFORMING ARTS

A college degree is becoming increasingly necessary for an acting career. Dramatic arts in college includes courses in liberal arts, speech, pantomime, play production, and drama.

Young people aspiring to acting careers need experience and should become involved with school plays and little theaters in the community.

Those aspiring to be dancers, dance teachers, musicians, music teachers, singers, and singing teachers should begin studying and receiving special instruction at an early age. A college education is an advantage in obtaining employment as a dance teacher or as a music or singing teacher. Employment as special performers requires professional training for several years. To get experience, young people should seize every opportunity to perform.

DESIGN AND PLANNING

A license is required for the practice of architecture. Requirements for a license include graduation from an accredited school, followed by three years of practical experience in an architect's office as a junior draftsman. Normally it takes a graduate several years to progress to chief draftsman, designer, or other positions, including establishing one's own practice.

Students interested in careers in architecture should take subjects in mathematics, physics, chemistry, and economics.

Most employers require their newly hired interior decorators and designers to have at least two or three years of formal art or interior decorating and design training. Many require a bachelor's degree with a major in interior design and decorating. New graduates may receive from one to three years of on-the-job training after being employed. Talented workers usually advance rapidly in the larger firms.

The completion of a course of study in industrial design—in an art department of a university or a technical college—may adequately prepare one for entry into industrial design. The prescribed curriculum may take from two to five years of study leading to a diploma. New graduates usually start as assistants to more experienced designers. Entrance to the course of study requires a high school diploma. Preparatory courses in high school would consist of science, mathematics, and mechanical drawing.

APPAREL

Apparel designers enter the industry in various ways. They may receive their training by working on the job with experienced designers, or through apprenticeship. Apparel firms recruit designers from colleges that offer specialized training in design.

Those aspiring to be models should take every opportunity to model at the high school or downtown stores, and to enter beauty contests. Enrolling in the home economics class will help one learn good grooming habits, poise, and carriage. Most employers prefer those who have at least a high school education. Many employers of fashion models prefer college graduates with good communication ability and a good general cultural background. There are reputable modeling and charm schools that offer well-rounded training experience.

Fashion designing is very competitive work. A college degree is recommended, though not required. Some colleges offer a degree in fine arts with a major in fashion design that may adequately prepare one to be a fashion designer. Most start their careers as design assistants.

Students may begin preparing for designing careers in high school by taking art courses, and by practicing sewing and making garments. Summer jobs in department or specialty stores will give valuable experience.

SPORTS

Most professional athletes, athletic coaches, and athletic directors are college graduates; this may not be a requirement for employment, particularly as an athlete.

WHAT ARE THE TYPICAL PERSONAL REQUIREMENTS OF THOSE SUCCESSFULLY EMPLOYED IN ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

Most advertising jobs require good usage of both spoken and written English. Pleasure in problem-solving is important. Advertising workers must like people. They must be able to accept criticism.

PERFORMING ARTS

Talent, interest, and determination are essential for success in occupations in the performing arts. Also, ability to memorize, good health, and the physical stamina to practice for many hours are necessary. Other assets are charm, poise, and good grooming habits.

PLANNING AND DESIGN

Persons interested in architecture, interior decorating and designing, and industrial designing should have a talent for drawing, a creative mind, and ability to work with people. Imagination and good business judgment are also important.

APPAREL

Fashion designers are required to have artistic ability, knowledge of fabrics, a keen sense of color, and an intense interest in how garments are made, including sewing and cutting.

Fashion models must be able to spend long periods of time standing and walking, in personal grooming, and improving body carriage and poise. They must be able to regulate their diets.

SPORTS

Those aspiring to be athletic directors, coaches, and players must have a desire to work with others, and an intense interest in sports activities. In addition, coaches and players must be in good health, strong, and agile. Professional athletes are relatively young compared to coaches and directors.

WHAT ARE THE EARNINGS OF THOSE EMPLOYED IN THE ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

Salaries for beginning advertising workers in 1969 ranged from $4,000 to $8,000 per year. Experienced workers in larger firms earned much more. For example, account executives' salaries ranged from $15,000 to $25,000 and copywriters' ranged from $8,000 to $20,000 annually.

PERFORMING ARTS

In 1967 actors and actresses on Broadway received about $130 weekly. Motion picture actresses were receiving $100 daily. Well-known actors and actresses received many times the figures cited. Dancers received $145 a week for stage productions. Musicians who were members of symphony orchestras had an annual salary of approximately $7,000. Some singers earned as much as $200 a week and well–known concert soloists, opera stars, and recording artists of popular music commanded $1,000 or more for each performance. The salaries of singing teachers, dance teachers, and music teachers in public schools are usually determinded by the salary schedule for all teachers in that system.

PLANNING AND DESIGN

Starting salaries for architects and industrial designers range from $100 to $150 a week. Interior decorators and designers generally receive from $70 to $90 per week. Experienced architects and industrial designers are paid $25,000 or more each year. Talented and experienced interior decorators and designers may earn $20,000 or more annually.

APPAREL

Beginning fashion models may earn up to $90 per week. Experienced models may earn as much as $125 per week. Apparel designers earn considerably more.

SPORTS

The salaries of professional athletes vary, depending upon the sport and the individual. Some have commanded earnings well over $100,000 annually. Ability and youth are vital elements in determining the salaries of players.

Beginning athletic coaches usually earn $5,000 to $7,000 annually. Experienced coaches and directors may earn $20,000 or more per year.

WHAT IS THE EMPLOYMENT OUTLOOK FOR ARTS AND ENTERTAINMENT OCCUPATIONS?

ADVERTISING

The development of new products and services and the increase in competition among producers of industrial and consumer goods will contribute to the demand for workers in advertising. However, advertising seems to attract young people; thus, those seeking entry will face stiff competition.

PERFORMING ARTS

Opportunities will be limited for those seeking to enter the performing arts occupations. The professional acting, singing, dancing, and musical fields have long been overcrowded with those aspiring to achieve fame in these occupations, and this is expected to persist. However, the demand for teachers of performing arts will be more promising.

PLANNING AND DESIGN

The outlook is for continued rapid growth in opportunities for careers in architecture in the 1970's. Growth will be rather slow in interior decorating and design and industrial design.

APPAREL

Chances of entering a career as a model are about one in ten. The opportunities for men in the modeling field are very limited.

There will be many opportunities throughout the 1970's for apparel designers, particularly women.

SPORTS

The demand for professional athletes, athletic directors, and athletic coaches will increase during the 1970's. However, there are increasing numbers seeking to enter these occupations. Employment opportunities will be limited except for those with determination, the required physical makeup, experience, and ability.

Determine through class discussion which of the Arts and Entertainment occupations are open to both sexes.

Involve the class in a research project to determine the graduates from your school who have entered Arts and Entertainment occupations during the past ten years. Discuss why the percentage is so low. Trace how at least one graduate entered and advanced in an Arts and Entertainment occupation. Identify the Arts and Entertainment occupations represented in your school. These would include the athletic director, athletic coaches, art teacher, and music teacher.

Determine where people in Arts and Entertainment occupations are employed in your community.

Arrange for an athlete, music student, art student, dance student, and singing student to give testimonials for the occupational orientation students.

Devise a check–list to pass to the students that would permit them to evaluate themselves against personal requirements of Arts and Entertainment occupations.

Discuss why such personal characteristics are essential for success and enjoyment in Arts and Entertainment work. Relate points brought out to specific occupations.

PHASE II: TRANSITION

Student comparison of abilities with the occupational requirements given in the content thus far, and participation in the classroom related activities, as well as educational aspirations, should have prepared each student for tentatively selecting and exploring one or more occupations on an individual basis.

Devise a check sheet or a progress chart for use in keeping a record of what the students are doing during the individual exploration periods. In using the progress chart, students would simply check with you each time they change direction and begin exploring a different occupation. This may also be useful in keeping records of all activities in which the students are involved in each unit.

Have students refer to the occupational groups at the beginning of the unit. Let them tentatively choose at least one occupation from this list. This selection should be compatible with his aptitude, interest, and educational aspiration.

PHASE III: INDIVIDUAL EXPLORATION

OCCUPATIONAL INFORMATION

This section has given a brief description of occupations and general characteristics of clusters or groups of occupations in the Arts and Entertainment Category. This has given students enough information to intelligently make a choice of one or more occupations to explore in depth. The classroom library has detailed information on each of the occupations in the Arts and Entertainment Category.

Students will use the Occupational Outlook Handbook, Dictionary of Occupational Titles, occupational briefs, films and filmstrips, tapes, and other materials to study the characteristics of specific occupations. This will be done during the class period and through outside reading. An occupational study form will be used during the study as a guide for pertinent information for which to look.

This is the beginning stage of individual exploration. Be sure that the students fully understand where the materials are located and how they are to be used. Study the Teacher's Handbook for information on how the students may get maximum benefit from exploration of printed materials, films, filmstrips, tapes, etc. See Appendix B for a suggested report form for use by the students when exploring an occupation.

When the students have had some time to do research on one or more occupations, let them make brief oral reports on their findings. The report form from Appendix B will serve as a reference sheet in making their presentations.

SUGGESTED ACTIVITIES

Students should know what a typical day is like in occupations selected to explore. Students should be involved in experiences related to these occupations that would help answer the following questions:

1. With what kinds of tools, machines, and materials will I be working?
2. What type tasks or jobs will I be doing?
3. Will I be dealing with data? Mathematical formulas?
4. With what kind of people will I be working?
5. Will I have to stand, sit, climb, balance, kneel, stoop, crouch, reach, lift, carry, push, talk, see, or hear?
6. Will I be working in hot, cold, dry, wet, noisy, dirty, indoor, or outdoor conditions?
7. Will I be exposed to bad odors, mechanical hazards, moving objects, burns, electric shock, explosives, or other hazards?

Choose activities from the following list that are related to the occupations tentatively selected for in-depth exploration.

This is the second stage in individual exploration. Study the Teacher's Handbook for descriptive information on the purpose of mock or simulated activities, and instructor and student roles during these activities. Arrange for the students to have several of the following exploratory experiences that relate to occupations that they have chosen to explore in depth.

ADVERTISING

A. Arrange to visit a newspaper publishing company, radio and television stations, printer, photographer, or an advertising agency that employs people in the advertising occupations listed in this Category. Since most people enter these occupations as clerks, assistants, or copywriters, find out what the typical day of work is like in such positions. Get someone to show you how advertisements are prepared, including planning, supervision, text-writing, illustrating, layout, and reproduction. Find out how many people are required to develop the advertisement.

B. Make a poster to be displayed in the classroom, using the following procedure:

1. Decide upon the materials needed and the size of the poster.

2. Decide upon a product or service you would like to advertise. Be creative.

3. Poll students in the classroom to determine interest in the product or service.

4. Get information on other products or services similar to your selection: prices, sales, and methods of advertising.

5. Find out the advantages and disadvantages your product or service has in relation to competing products and services.

6. Create jingles, make up slogans, and write the descriptive information to be included on the poster. Attract the attention of the students!

7. Determine how you are going to arrange the layout of the slogans, jingles, illustrations, and descriptive information on the page. Determine what size illustrations and print to use on the poster.

8. Complete the poster. Do your own printing by hand, using various sizes, shades, and colors. Use illustrations from magazines, newspapers, etc., or do your own illustrating, using various shades and colors. You may find ideas from books, magazines, newspapers, from television commercials, billboards, or store window displays.

9. Place the poster so students in and outside the classroom can view it for study. Observe the reaction of those who view the poster.

C. Read the following book:

Johnson, George, Your Careers in Advertising. New York, New York 10018: Julian Messner, 1 West 39th Street, (n.d.). 208 pp., $3.64.

PERFORMING ARTS

A. Plan to work with your English teacher in doing the following activities (those interested in music should work with the music teacher):

1. Obtain a copy of a short drama or comedy with parts representing acting, dancing, and singing.

2. Select a character represented in the production. Study personal characteristics, the essence of the characters, and the relationship of the character to the overall scheme of the play.

3. Memorize about 25 lines spoken by the character you have selected.

4. Try imitating the character in voice, song, or dance.

5. Having read, studied, and memorized the lines, audition before the English teacher (or music teacher). Have the English teacher criticize your performance.

B. Volunteer for a part in one of the school plays or in some other local production. Even working on the props or lighting will provide insight into the field.

C. Attend a local production. Observe the costumes, stage setting, and lighting. Notice the makeup on the faces of the performers. Interview at least one performer after the presentation.

D. Enlist in talent shows sponsored by the school, civic clubs, and churches.

E. Plan to see one of the following films:

1. Ballerina. Canadian Consulate General, Suite 2110, International Trade Mart, 2 Canal Street, New Orleans, Louisiana 70130.

2. Music: Career or Hobby? Coronet Films, Sales Department.

F. Read one of the following books:

1. Curtis, Robert. Your Future in Music. New York, New York 10010: Richards Rosen Press, Inc., 29 East 21st Street, [n.d.]. $2.79.

2. Denis, Paul. Opportunities in a Dancing Career. New York, New York 10017: Vocational Guidance Manuals, 235 East Forty-fifth Street, (n.d.).

3. Hirchfeld, Burt. Stagestruck: Your Career in the Theatre. New York, New York 10018: Julian Messner, 1 West 39th Street, (n.d.). 192 pp., $3.64.

4. Moore, Dick. Opportunities in Acting. New York, New York 10017: Vocational Guidance Manuals, 235 East Forty-fifth Street, 1969. Paperbound $1.95, library edition $3.75.

5. Spaeth, Sigmund. Opportunities in Music Careers. New York, New York 10017: Vocational Guidance Manuals, 235 East Forty-fifth Street, 1969. Paper bound $1.95, library edition $3.75.

6. Taylor, Theodore. People Who Make Movies. Garden City, New York 11530: Doubleday and Company, Inc., 501 Franklin Avenue, 1964.

7. Ward, John Owen. Careers in Music. New York, New York 10003: Henry Z. Walck, Inc., 19 Union Square West, 1968. 128 pp., $3.75.

DESIGN AND PLANNING

ARCHITECT

A. Use your imagination and design a modern building. Sketch the building on paper. Write a three page report telling how the building would be located on the lot, type of foundation you think should be used, materials used in construction, and how much you think the materials and labor would cost. You may use building materials and building construction books as research materials.

B. Consult with your mathematics teacher in arranging a series of math problems dealt with in architectural work. For example, how would you figure the total square foot area required for a wall foundation footing when the load-and soil-bearing capacity is given? How would you figure the size air-conditioning unit needed for a house with 1200 square feet of floor space? (Such solutions can be found in building materials and construction books, and drafting books.)

C. Consult with the drawing instructor in arranging to draw a floor plan for a house, giving dimensions and notes. Study a mechanical or an architectural drawing book to see how to practice lettering, use of instruments, etc.

D. Plan to view the following filmstrip:

Architecture and Your Life. 1963. Silent, 50 frames. American Institute of Architects, Librarian, 1735 New York Avenue, Northwest, Washington, D.C. 20006. Single copy free for retention.

INTERIOR DECORATOR-DESIGNER

A. Work with the home economics teacher in doing the following activities:

1. Determine some factors to take into consideration when planning the arrangement of furniture in a home, selection of furniture (including colors), draperies, floor coverings, etc.
2. Sketch plans for furniture arrangement for a large living room or office. Use colors in completing the work.
3. Make a study of the various paints, wallpaper, and fabrics used in interior decorating.

B. Tour the lobby of a motel or doctor's office to view the arrangement of furniture, fabrics from which the draperies are made, wall decorations, wall colors, floor covering, and other physical features of the room. Write a three page report of your findings.

C. Read the following book:

Ball, Victoria. Opportunities in Interior Design and Decorating. New York, New York 10017: Vocational Guidance Manuals, 235 East Forty-fifth Street, 1969. Paperbound $1.95, library edition $3.75.

INDUSTRIAL DESIGNER

A. Select a product such as a household appliance, cooking utensil, or an automobile. Use your imagination to modify certain features of the product that would make it more useful.

B. Consult with the drawing instructor in arranging to develop a two- or three- view drawing of a familiar object in your home, showing dimensions and notes. Study a mechanical drawing book to see how to do some practices in lettering and to learn how to use drawing instruments.

APPAREL INDUSTRY

FASHION DESIGNER

A. Work with the home economics teacher in doing the following:

1. Without the use of patterns and illustrations, sketch your idea for a male or female piece of clothing.

2. Develop the pattern on paper for making the garment.

3. Cut out the pattern pieces.

4. Pin the paper pieces together with straight pins (on a model if possible).

5. Make any modifications you think necessary.

6. You may wish to try sewing a garment from your design.

B. Take a tour through a department store to see which fabrics and styles are being bought by the public.

C. Arrange to see the following filmstrip:

The Designer. 1962. 11 ½ min., color. National Cotton Council of America, Audio Visual Services, P. O. Box 12285, Memphis, Tennessee 38112.

D. Read the following books:

1. Fashion Group, Inc. Your Future in Fashion Design. New York, New York 10010: Richards Rosen Press, Inc., 29 East 21st Street, [n.d.]. $2.79.

2. Head, Edith. Fashion as a Career. New York, New York 10018: Julian Messner, 1 West 39th Street, [n.d.]. 208 pp., $3.64.

FASHION MODEL

A. Interview the home economics teacher. Find out what personal characteristics an individual must possess in order to be a successful model. Ask to check out reading materials on fashion careers.

B. Interview a local clothing store owner, manager, or buyer employing models either part-time or full-time. Ask for professional opinions concerning your chances for success as a model.

C. Apply for a job modeling teen-age styles at a local clothing store during out-of-school hours.

D. Read one of the following books:

1. Head, Edith. Fashion as a Career. New York, New York 10018: Julian Messner, 1 West 39th Street, [n.d.]. 208 pp., $3.64.

2. MacGill, Gillis. Your Future as a Model. New York, New York 10010: Richards Rosen Press, Inc., 29 East 21st Street, [n.d.]. $2.79.

SPORTS

A. Participate in at least one phase of your school's athletic program.

B. Interview your school's athletic director or coaches. Ask for the following information: the sports in which they participated while in high school and college, what was required of them when they were participants, how much education is required of coaches and athletic directors, earnings and fringe benefits received by athletic coaches and directors, and advantages and disadvantages of working with athletic programs.

PHOTOGRAPHY

A. Join the camera club in your school, if there is such an organization. Learn how to take as many different kinds of pictures, using as many different kinds of cameras, as possible. Try developing pictures in a darkroom, cutting pictures to desired sizes, enlarging, and retouching pictures. Acquire a photography book and study the methods and techniques of taking pictures, developing pictures, enlarging, and retouching.

B. Arrange to visit a photography studio. While there, observe the activities of the photographer while he takes portraits. Interview the photographer to find out about the requirements of photography careers, methods of entering and advancing in the field, and earnings and fringe benefits.

EVALUATION

Some student and teacher evaluation tools have been suggested throughout this unit. There should be a culminating evaluation at this point to determine (1) the behavioral changes produced by the presentation of the general introductory information to the group and (2) the behavioral changes occurring from individual exploration of specific occupations.

See Appendix C for a sample evaluation questionnaire.

PHASE IV: EDUCATIONAL PLANNING AND PROJECTION

Individual exploration is continued. Review the Teacher's Handbook on the purposes of educational planning and projection, and student and teacher roles during these work periods.

Students have had an opportunity to look closely at their fitness for one or more occupations in the Arts and Entertainment Category. However, all these occupations require preparation of some sort before the prospective worker is ready to assume on-the-job responsibilities.

This preparation includes both general education and specialized training. The floral designer and the renderer-delineator may not need to prepare beyond a period of specialized training after high school at a trade or technical school, whereas the advertising account executive and the athletic director are required to have at least a bachelor's degree from a four year college or university. Architects spend about five years in obtaining a degree in architecture. They must also have several years of practical experience in a registered architect's office in order to qualify for a license.

Discuss the relationship between certain high school courses and college entrance requirements. Point out licensing and certification requirements for certain Arts and Entertainment occupations.

Review some of the more common type knowledges and skills needed in preparation for Arts and Entertainment occupations.

Reemphasize the need for completing high school and for additional training.

Review minimum educational requirements for certain occupations. Explain the changes taking place in these requirements.

Select three or more occupations in the Arts and Entertainment Category requiring different types of educational preparation, and trace the education and training needed from the beginning of high school until employment. Secure catalogs from each of the public and private junior colleges in Mississippi. Determine which colleges offer programs leading directly to employment in Arts and Entertainment occupations after successfully completing the prescribed courses (i.e., nursing, police science, fireman, food service).

Secure catalogs from each of the four–year colleges and universities in Mississippi. Determine which institutions offer preparation for Arts and Entertainment occupations (i.e., music, architecture, advertising).

Let each class member investigate the kind of education and training needed for the occupations he has tentatively chosen. Determine the time necessary for preparation and the cost of such preparation.

Point out the other type educational offerings leading to Arts and Entertainment occupations (e.g., cooperative programs, technical programs).

Get a complete list of course offerings in your school. Learn how English, mathematics, science, and other subjects contribute to the development of skills needed in Arts and Entertainment occupations. Determine what courses are required of all students and why. Find out what elective courses are offered and which ones would be beneficial in planning for Arts and Entertainment occupations.

Find out what courses offered in your school would lead directly to employment after high school. Arrange to discuss with the teachers how these courses would help in preparing for Arts and Entertainment occupations.

APPENDIX A

PRE–TEST QUESTIONNAIRE

For use at the beginning of the unit to determine what the students presently know about occupations in this category.

Note: A grade will not be attached to this questionnaire. A list of occupations in this category should be at hand.

1. List the occupations in this category with which you are most familiar:
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
2. How did you acquire information about these occupations?
   ____
   ____
3. List the typical duties and work roles performed by people employed in the above listed occupations.
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
4. Which occupations in the business contact category are you most interested in?
   a ____________________
   b. ____________________
   c. ____________________
5. What facts about these occupations caused your interest in them?
   a. ____________________
   b. ____________________
   c. ____________________
6. What personal qualities do you think you have that would be helpful in working in the business contact occupations in which you are interested?
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
7. How much education, experience, and training do you think a person needs for entrance into the occupations in which you have shown an interest?
   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________

APPENDIX B

OCCUPATIONAL STUDY OUTLINE

TITLE

DUTIES PERFORMED

QUALIFICATIONS (personal requirements)

AGE: How old must I be to enter the occupation?

SEX: Is there opportunity for my sex?

SPECIFIC PHYSICAL AND HEALTH REQUIREMENTS: Am I the correct height to do the work? Are my eyesight and hearing adequate? Am I strong enough?

INTEREST: Do I possess this interest? If not, could I develop interest in this type work?

ABILITIES: Do I possess these abilities? If not, could I achieve or learn the knowledge and skills necessary to do the job?

PERSONALITY: Do I possess the personal qualities necessary for doing this type work? If not, could I develop these qualities?

VALUES AND ATTITUDES: Does anything about this job violate values and attitudes I have about people and work? If so, could I adjust to situations that required that I change my values and attitudes?

PREPARATION: What subjects do I need to study? What special training will I need? How long will it take to receive this training? How much will it cost? Can I get this training within the state? Is work experience required for entry into this occupation? What is the method of entry into this occupation?

WORKING CONDITIONS ON THE JOB: Is it hazardous work? Is it noisy or dirty? Will I be working in shifts? Will I work indoors or outdoors? Is it hard work? Does the work require being away from home for long periods of time?

REWARDS FROM WORK: How much is the beginning pay? Is there chance for advancement? Will this work experience help me get a better job? Would I be happy doing this type work?

EMPLOYMENT OUTLOOK: How many are employed in the occupation at present? Are there employment opportunities in my community or state for this type work?

SPECIAL REQUIREMENTS (such as certification,licenses, and examinations)

APPENDIX C

EVALUATION QUESTIONNAIRE

Section I

1. Did you enjoy studying occupations in the business contact category? (Check one)

2. What occupations did you like the most?
   a. ____________ c. ____________
   b. ____________

3. What occupations did you like the least?
   a. ____________ c. ____________
   b. ____________

4. What special interests do you have that would help in meeting requirements for success in occupations in the business contact category?
   a. ____________ c. ____________
   b. ____________

5. What special abilities do you have that would help in meeting requirements for success in occupations in the business contact category?
   a. ____________ c. ____________
   b. ____________

6. Can you identify certain of your personal traits and abilities that may prevent success and satisfaction in these occupations? List these.
   a. ____________
   b. ____________
   c. ____________

Section II Evaluation of individual or small group activities

1. Occupations explored:
   a. ____________
   b. ____________
   c. ____________

2. What additional personal requirements (skills, interests, capacities) did the simulated or mock activities reveal about the occupation(s) you investigated?
   a. ____________
   b. ____________
   c. ____________

3. What doubts did the simulated or mock activity raise in regard to your self-estimate of this occupation as a possible career choice?

a. ____________________

b. ____________________

c. ____________________

4. What doubts did the simulated or mock activity remove in regard to your self-estimate of this occupation as possible career choice?

a. ____________________

b. ____________________

c. ____________________

5. Have you eliminated any occupations from consideration as a career choise as a result of this activity? Which ones? Yes ______ No ______

a. ____________________

b. ____________________

c. ____________________

6. Do you feel that you had enough time to investigate the occupations in general and the occupations(s) of your choice? Yes ______ No ______

7. Did you observe activities of people engaged in the occupation which you were most interested?

Yes ______ No ______

List these:

a. ____________________

b. ____________________

c. ____________________

8. Were you involved in on-the-job experiences in the occupation(s) you investigated?

Yes ______ No ______ Where? ____________

List these activities:

a. ____________________

b. ____________________

c. ____________________

9. Would you like to review what the tests reveal about your abilities, interests, and limitations; and the interpretation and use of these test results? Yes ______ No ______

10. Has your exploration of occupations in the business contact category caused you to want more information as to general education and training needed for entrance into these occupations?

Yes ______ No ______

List the occupation(s) for which you need additional information and direction.

a. ____________________

b. ____________________

c. ____________________

APPENDIX D

DO YOU LIKE OR DISLIKE? Check ( ) one

	Don't Know	Like	Dislike
1. Selling Christmas cards or tickets for a school play	______	___	______
2. Calling people on the telephone	______	___	______
3. Having a paper route and soliciting subscriptions	______	___	______
4. Organizing a social function which requires funds	______	___	______
5. Buying articles at an auction and reselling	______	___	______
6. Entering into discussion with others	______	___	______
7. Selling advertisements for a school paper	______	___	______
8. Having a Saturday job selling clothes	______	___	______
9. Recruiting club members	______	___	______
10. Conducting party games	______	___	______
11. Being the business manager of the school newspaper	______	___	______
12. Showing school projects at a county fair	______	___	______
13. Meeting new people	______	___	______

Appendix E

Rating Sheet For Class Persuasive Presentation

Name of
Person Presenting ______________________ Critic ______________________

Customer ______________________ Date ______________________

Product or Service Presented ______________________

PRESENTER	EXC.	V. Good	Good	Fair	Poor	PRESENTER'S SCORE
Did he show knowledge of prospect's needs and personal character?	5	4	3	2	1	
Was the approach correct for the selling situation?	5	4	3	2	1	
Was an appropriate greeting used, prospect's attention gained effectively, and prospect's interest aroused effectively?	5	4	3	2	1	
Was the presenter groomed properly?	5	4	3	2	1	
Did he speak clearly and distinctly?	5	4	3	2	1	
Was the product or service shown effectively?	10	8	6	4	2	
Did he have sufficient product or service information?	15	12	9	6	3	
Did he meet objections tactfully?	10	8	6	4	2	
Was he interested in the customer's problems?	5	4	3	2	1	
Was the product or service demonstrated effectively?	10	8	6	4	2	
Did he close the sale effectively? Was his departure smooth and poised?	10	8	6	4	2	

Was the financial transaction procedure executed effectively?	10	8	6	4	2	
TOTAL POSSIBLE POINTS		100				

CUSTOMER	Graded on Basis of	CUSTOMER'S SCORE
1. Had enough product or service knowledge to ask intelligent questions.	40	
2. Raised reasonable objections; did not yield too soon.	40	
3. Effectively played the part he was supposed to play.	20	

APPENDIX F

The following projects can be adapted for use in exploring the activities in any of the business contact category. Experiences unique to an occupation can be included. It can be done by two or more students, or by a student and the instructor.

Adaption of this project to any given business contact occupation will require some revision. Some points listed do not apply to all occupations. It will involve the student in a learning experience through planning the activity and participating in the planned activity.

1) Planning
    a. Decide specifically what commodity or service you want to persuade someone to buy or sell. Some of the commodities and services that may be considered are as follows:
        1) Office machines
        2) Aircraft
        3) Automobiles
        4) Casualty insurance
        5) Chemicals and drugs
        6) Communication equipment
        7) Dental and medical equipment and supplies
        8) Food products
        9) Household equipment
        10) Public utilities
        11) Stocks and bonds
        12) Welding equipment
        13) Machinery
        14) Floor coverings

Acquire a sample for use in the session when unable to use the items in this list. Use photographs, or some substitute.

    b. Get information needed to intelligently discuss that which is to be bought or sold, such as:
        1) Cost or sale price
        2) Where produced, headquarters
        3) Decrease or increase in value after bought or sold
        4) People involved in production
        5) Purpose and/or use by person buying
        6) Quality of product or service
        7) Technical information needed for demonstration
        8) Reliability of product or service
        9) Transportation and handling

Note: Some of these will not apply to all occupations. Some deletion and addition of other factors will be essential.

    c. Get information about the person who will buy or sell the commodity or service decided upon:

1) Age
2) Education
3) Sex
4) Reason for buying or selling
5) Financial status
6) Credit references (if buying on credit)
7) Marital status

d. Acquire some of the work samples frequently used by those employed in the occupation(s). Examples: catalogs; forms for price estimations, credit terms, trade-in allowances, discount computations, sales contracts, expense accounts, specifications, credit applications, promotional campaign materials; and written correspondence concerning publicity, solicitation, collections, etc.

e. Prepare a rating sheet for student use in evaluating each other in the sales presentation and related paper and computational work. It should simply require the students to make check marks. (See Appendix D for a sample)

f. Arrange the occupational setting. Have at hand all items needed in the presentation.

g. Set up equipment (if applicable) and arrange all materials.

h. Develop and organize the points to be included in the presentation. Get ready to meet the customer.

2. Presentation

Every persuasive presentation must be built around several basic steps:

a. Gain the attention of the prospect and let him know what you have to offer.

b. Arouse the interest of the prospect by telling him more about what you have to offer. This may require a demonstration or just clear explanation of the goods or services presented.

c. Answer any objections he may have. Let the customer talk. Then, be prepared to answer in convincing terms.

d. Obtain a favorable decision from the customer. Statements must be backed up and specific facts, technical information, advantages, and comparisons given during the presentation in order to convince the customer that he needs the item.

e. Perform the closing activities. The actual sale may come during a later call, or after further demonstration, but most will close on the first call. Self-confidence, courage, persistence, and aggressiveness must be at a peak at this point. The consumer, or representative, will sometimes indicate what his intentions are at some point during the presentation. Otherwise, the salesman must ask committing questions, imply ownership, re-emphasize the customer's, or representative's, need to buy or sell, and summarize advantages. Finally, the financial transaction and paper work must be handled. This should be typical of an actual transaction.

3. Evaluation

   The students may use the rating sheet for presentations to evaluate the student and the consumer or representative as the salesman presents the product or serivce. The teacher-counselor should rate the students using the same medium (see Appendix D for example).

In-depth study

1. Local retail stores
   a. Buyers
   b. Salesman
   c. Supervisors
   d. Managers

2. Wholesale outlets
   a. Managers
   b. Supervisors

3. Real estate offices

4. Insurance agents

   Students may choose to acquire information from the following sources:

1. Consumer guides
2. Trade journals
3. Library references (school)
4. Merchandising manuals
5. Sales manuals
6. United States Government publications
7. Popular periodicals
8. Consumers (people who have bought a product or service from someone engaged in this occupation)
9. Trade associations

Students may also be involved in direct exploratory experiences at a local firm. They may observe the activities being carried out by people engaged in the occupations. Also, they may interview successful workers in business contact occupations. This should be arranged with the employer and the worker well in advance.

APPENDIX G

RELATIONSHIP INVENTORY

The following check list briefly characterizes typical situations found in the service occupations. The purpose of the list is to help you record and to weigh your reactions to contacts of a certain nature. No doubt you have had many of the experiences listed. The situations, written in question form, will help you see which qualities you possess and which you desire to improve. Also it will help you recognize qualities you do not have and which might make certain kinds of work distasteful.

Place a check in the column which best fits your reaction.

		Check ( ) one	
Would you like or dislike?	Don't Know	Like	Dislike
1. Work in which you wait on others	______	______	______
2. Having people come to you for help	______	______	______
3. Going up to a stranger and beginning a conversation	______	______	______
4. Studying why people act and think as they do	______	______	______
5. Working with people who are queer or far-out in some way	______	______	______
6. Prefer to be around people rather than alone	______	______	______
7. Having to remember names and faces	______	______	______
8. Dealing with emergencies	______	______	______
9. Being around nervous people	______	______	______
10. Making people mentally or physically comfortable	______	______	______
11. Making instant decisions between two unpleasant alternatives	______	______	______
12. Meeting and talking to people	______	______	______
13. Meeting all kinds of people	______	______	______
14. Helping people with personal problems	______	______	______
15. Helping a person get a job	______	______	______
16. Making decisions based only upon your observations and experiences	______	______	______
17. Being around poor people	______	______	______
18. Being around people of different races	______	______	______
19. Serving people at a gas station	______	______	______
20. Arranging a friend's hair	______	______	______
21. Caring for sick people	______	______	______
22. Examing sick people and giving them medicine	______	______	______

23. Working for a mission which provides meals for the poor ______ ______ ______

24. Defending car thieves in a court ______ ______ ______

25. Arresting people caught robbing a store ______ ______ ______

26. Cooking and serving meals ______ ______ ______

27. Driving people around town ______ ______ ______

28. Calm crying children ______ ______ ______

29. Preach sermons ______ ______ ______

30. Go into a burning building to rescue people ______ ______ ______

APPENDIX H

BEST HIGH SCHOOL

YOUR TOWN

ABC Corporation
1234 W. Main Street
Anytown, Anystate 00000

Dear Sir: Re: You Can Be An Electronics Technician

Best High School is expanding its curriculum offerings to include a course in Occuaptional Orientation. The purpose of the course is to introduce all students to a broad range of occupations and to encourage a rational approach to the selection of one's life work.

The _Occupational_ _Outlook_ _Handbook_ lists your corporation as the source for the material referred to above. We wish to use this material in our instructional program. Please send sample copies and list prices for the following quantities:

1 Copy
2-5 Copies
5-10 Copies

Thank you for your assistance. Since classes begin the first week in September, we look forward to receiving your material at the earliest possible date.

Sincerely,

J. Jones, Principal
Your High School

S. Smith, Instructor
Occupational Orientation